The Veterinary Record.

FOUNDED BY WILLIAM HUNTING, F.R.C.V.S., 1888.

No. 38. SEPTEMBER 20, 1930. VOL. 10.

Some Normal Features of the Stomach of the Dog.

By W. P. Blount, M.R.C.V.S., Centenary Post-Graduate Fellow, Royal (Dick) Veterinary College, Edinburgh.

During the supervision, over a period of two years, of the routine dissection of the dog, the writer was struck with the apparent great variation, both in size and character, of the stomach. Observations on about 30 dogs revealed the fact that animals of apparently the same body weight frequently possess stomachs of widely varying capacities. A typical example illustrating this point may be seen from Table I, where dogs number six and nine both weigh about 25 lbs. each, but the capacity of the one stomach is more than double that of the other—also seen in animals of similar weight, Table III. Although no history of any of the animals was available, it was clear that these very definite variations are of interest to the canine practitioner, because either the fact is not stated in text books, or not sufficiently emphasised in the teaching of veterinary students.

Strangely enough, important though the organ is, an accurate, detailed description of the dog's stomach is hard to find.

CAPACITY.

Miller (1928) states that "the dog's stomach is relatively large, holding about five to seven pints in animals of average size." This is quite at variance with the specimens seen in the dissecting room; for, although hardened in formalin, many had an approximate capacity of less than half a pint, which would mean that they would have to be distended 10 to 14 times to contain the stated, normal quantity of fluid. Support, however, appeared to be given by Banham and Young (1926), who, in their Table of Capacities, give for the dog's stomach limits of variation from 1¼ *pints to* 1¾ *gallons*, with an average of 2½ *quarts*: it was seen later that these authors were apparently quoting Sisson (1914), who states that "the stomach's capacity in a dog of about 40 lbs. is about six to seven pints." Quoting the estimates of Colin, the following figures are given:—

Average capacity=3,000 c.c. (ca. 6⅓ pints) with variations from 600-8,000 c.c. (1⅛ to 17⅓ pints.)

The average capacity of the human stomach is estimated at 1·2 litres (2⅛ pints)—not much more than ⅛ of that of a dog of average size.

(Apparently there is here a series of printer's errors, for, assuming that the litre is equivalent to 1·76 pints, the following figures should be substituted:

3,000 c.c.=5⅓ pints. 600-8,000 c.c.=1 to 14 pints. 1·2 litres=2·1 pints.)

Little additional help in the matter is gained from a study of other text books on allied subjects, for neither Blaine (1851), Bradley (1927), Brumley (1922), Friedberger and Fröhner (1908), Greig (1924), Hutyra and Marek (1926), Linton (1927), Paton and Orr (1920), Smith (1921), nor Strangeway (1886), indicate the capacity of the dog's stomach.

In order to determine more exactly this measurement, observations on 30 dogs have been made. In nearly every instance the stomachs were removed from the cadavers immediately after death: one or two only remaining in the carcass a few hours. An *estimate* was made of the animal's bodyweight, but the capacity of the stomach was *accurately* measured. Notes were taken of the available history of the animals, actual size freehand drawings of the stomachs were made, the curvatures measured and any macroscopic features noted. The animals were found to be divisible into three classes:—

(*a*) Those whose histories indicated ill-health with definite involvement of the stomach, as in pyometritis, gastritis, persistent vomiting, etc.

(*b*) Those considered normal concerning their alimentary canal, but which at *post-mortem* showed evidence of altered stomach characters, and

(*c*) Those which had no history to indicate gastric abnormality, and, on examination, presented stomachs with normal macroscopic features.

Because the majority of the animals were "town dogs" it was difficult to obtain many without gastric complication: over 50 per cent. of the dogs were destroyed for affections quite disassociated from the alimentary canal (and therefore, presumably normal in this feature), but it was finally found that of the total number of dogs examined (30), only seven were reasonably normal. Table I gives the details of the findings. The most striking feature is the fact that the capacity of the dog's stomach is very much lower than is generally believed. It will be seen later that, as the majority of conditions associated with the stomach cause dilation, the capacities quoted as an average of the whole series of observations cannot be considered low.

TABLE I.

Data concerning the stomachs removed from freshly-killed dogs.

No.	Estimated Weight, lbs.	History	Condition of Stomach	Water-distension Capacity
1	30	Normal	Normal	650 c.c.
2	40	Normal	Dilated	900 c.c.
3	15	Abnormal	Hypertrophic	275 c.c.
4	10	Normal	Normal	250 c.c.
5	18	Normal	Dilated	450 c.c.
6	25	Normal	Normal	400 c.c.
7	30	Abnormal	Dilated	900 c.c.
8	45	Normal	Normal	1,500 c.c.
9	25	Normal	Hypertrophic	1,050 c.c.
10	25	Normal	Dilated	1,400 c.c.
11	20	Ulcer	Ulcer	800 c.c.
12	30	Normal	Dilated	1,150 c.c.
13	15	Abnormal	Gastritis	1,150 c.c.
14	30	Abnormal	Dilated	1,200 c.c.
15	25	Normal	Dilated	1,500 c.c.
16	60	Normal	Dilated (?)	3,000 c.c.

DEPT. OF VET. MEDICINE

No.	Estimated Weight, lbs.	History	Condition of Stomach	Water-distension Capacity
17	35	Normal	Dilated	1,650 c.c.
18	20	Normal	Dilated	900 c.c.
19	15	Abnormal	Dilated	600 c.c.
20	38	Abnormal	Dilated	1,000 c.c.
21	10	Abnormal	Gastritis	350 c.c.
22	12	Abnormal	Gastritis	375 c.c.
23	10	Abnormal	Dilated	525 c.c.
24	25	Normal	Normal	700 c.c.
25	11	Normal	Dilated	500 c.c.
26	35	Normal	Dilated	1,800 c.c.
27	18	Abnormal	Ulceration	700 c.c.
28	25	Abnormal	Normal	1,200 c.c.
29	25	Abnormal	Ulceration	1,000 c.c.
30	37	Normal	Normal	1,700 c.c.

Variations from 250 c.c. (·44 pints) to 3,000 c.c. (5¼ pints) occurred, and the average figure for the seven normal dogs was about 1,080 c.c., 38·6 ozs. or nearly 2 pints. Animals believed to be normal, but which on *post-mortem* examination showed abnormal gastric structure, had an average capacity of 1,206 c.c., whereas those known to be suffering from diseases associated with stomachic lesions had an average capacity of 813 c.c.

Cunningham (1906) believed that the measurements of capacity given by Martin were probably the most accurate for man: he states that the capacity varies between 9 and 59 ozs. (256-1,676 c.c.) with an average capacity of from 35 to 40 ozs. (994-1,136 c.c.), thus qualifying the statement of Sisson. It can clearly be seen, therefore, that the average capacity of the dog's stomach is approximately the same as that of man, and not one-third as great, as previously quoted.

It must be clearly understood that the figures mentioned are "distension" capacities, and not in any sense physiological, in that the stomachs were as fully distended as possible with water. Any animal having its stomach distended as full as was carried out during the above tests, would, in life, no doubt, suffer the most agonising pains.

It was observed that when two-thirds full the organ appeared to be comfortably dilated, a state which is more probably normal for health and which would suggest that the *physiological capacity* of the average dog's stomach is about 720 c.c. or 26 ozs. It is reasonable to conclude, therefore, that the average dog cannot comfortably accommodate more than the equivalent bulk of 1½ pints of water. Veterinarians generally agree that the pernicious habit of feeding a dog but once in the day is absolutely contrary to the maintenance of good health: this would appear to be supported by the above conclusions. Either, therefore, the dog should be fed twice in the day with concentrated foods, preferably of a carnivorous nature, or should receive even smaller amounts of food several times in the day; always taking into account the nature of the animal's environment.

Curvatures of the Stomach.

Sisson (1914) states that "the greater curvature is nearly four times as long as the lesser curvature," but fails to add that this is for the fully distended organ. In figure 439 (The Anatomy of the Domestic Animals," Second Edition, p. 498), the greater curvature of a stomach containing a small amount of ingesta is 2·7 times as long as the lesser curvature., whereas in the organ well filled (Figure 438) it is four times as long.

In the observations of this paper the average ratio between the lengths of the lesser and greater curvatures for normal dogs' stomachs is 1:2·31 when the organ is empty (Table II.)

Table II.

The respective lengths of the lesser and greater curvatures of the empty stomachs of freshly-killed dogs, and their ratios.

Dog. No.	L. C. cms.	G. C. cms.	Ratio.
1	16	32	1 : 2·00
2	14	37	1 : 2·50
3	9·5	22·5	1 : 2·30
4	10	22	1 : 2·20
5	7·5	14·5	1 : 3·00
6	10	25	1 : 2·50
7	16	40	1 : 2·50
8	16	32	1 : 2·00
9	11	27	1 : 2·45
10	10·5	29	1 : 2·76
11	12·5	28	1 : 2·23
12	9·5	28·5	1 : 3·00
13	10·5	26	1 : 2·47
14	9·0	30	1 : 3·33
15	8·5	26	1 : 3·06
16	16	44	1 : 2·75
17	10·5	35	1 : 3·33
18	10	30	1 : 3·00
19	8	24	1 : 3·00
20	—	—	—
21	—	—	—
22	8·5	19·5	1 : 2·30
23	8·5	22	1 : 2·59
24	11	25	1 : 2·27
25	5	15	1 : 3·00
26	11	34	1 : 3·10
27	11	25	1 : 2·27
28	11	27	1 : 2·45
29	12	30	1 : 2·50
30	13·5	31	1 : 2·30

The Mucous Membrane of the Stomach.

Text-books of veterinary anatomy do not give a full description of the macroscopic features of the interior of the dog's stomach. The best is that by Bradley (1927); Sisson shows a photograph of a moderately distended stomach but fails to describe its mucosa, and Miller states that "the lining of the stomach is not folded or ridged as in some of the other animals."

It is not intended to describe in detail the characters of the interior of the organ, but merely to add those features which are ordinarily missing from text-books and which are of value to the clinician.

On first handling the organ fresh from the cadaver, the normal stomach shows two well-marked features; firstly, a general tone exhibited by the whole structure (replaced by "flabbyness" in the majority of stomachs due to a thinning of the walls), and secondly, a definite thickening of the pars pylorica. On distending with water it will be seen that this portion of the stomach fails to distend appreciably when compared with the "body": this is due, partly to hypertrophy of the muscles (which precedes the more definite aggregation of muscle fibres at the pyloric valve) and partly to the strength of the mucous membrane.

There is usually quite a sharp line of demarcation between the thickened pyloric area and the thinner fundus: this is in line externally with the angle (incisura angularis) of the stomach.

It is easiest to examine the interior by slitting the organ along its greater curvature; the stomach may then be laid out flat and in shape it resembles greatly a flat fish, such as the skate.

ŒSOPHAGUS.—The terminal portion of the œsophagus has about 4-6 well-marked longitudinal grooves, with many fine transverse striations between them. The pale mucous membrane extends into the apparent limits of the stomach to end sharply with a semi-elliptical margin at the cardia. These characters are different in the cat.

FUNDUS.—The character and disposition of the mucous membrane of the fundus is important. It is found to vary markedly, and is chiefly present in the form of folds and ridges. It is not difficult to distinguish the folds, which are more or less permanent structures (in that they reassume their shape after complete distension of the stomach with water), from the ridges, which are irregular and of less uniform character. The *apparent* continuation of the œsophagus towards the duodenum through the stomach, is in the region of the lesser curvature, and this is usually free of folds or ridges. Passing towards the greater curvature, definite folds of mucous membrane make their appearance. They increase in height and length to the last two, which are smaller in these dimensions: on the average there are about 10 primary folds running in the longitudinal direction with side branchings at irregular intervals. Two of the primary folds appear to extend into the pyloric portion, where they terminate and so effectually act as the line of demarcation between the pars pylorica and the fundus. In the region of the "angle" of the stomach the folds appear most sinuous and are packed closely together. The primary function of the folds appears to be to give increased surface for glandular structures, although with increasing distension they tend to disappear and seem to be partly related to the capacity of the organ.

The remainder of the surface of the fundus is covered with ridges:—low, rounded, linear elevations of mucous membrane produced entirely through the action of the strong muscular layers on the empty organ. On distending the stomach with water the ridges quickly disappear, but are seen again in their sinuous character upon release of the pressure; their character and number are inconstant and entirely depend upon the state of the stomachic contents. There are, of course, arrangements of mucous membrane which are neither typical "folds" nor "ridges." Between the ridges and folds an uneven, slightly honeycomb appearance of the mucous membrane may be seen: probably associated with glandular pits, etc.

PYLORUS.—Here, the mucosa is much less irregular, due to the presence of few folds which are of low height; although on careful examination normal animals will exhibit fine transverse striations due to shallow, cryptic, linear depressions. The folds tend to appear ridge-like in character, due to their decrease in height and the ease with which they disappear on pressure. Four to six may be present; they are of short length, wide at their base and only occasionally sinuous. Two may apparently form the termination of the pars pylorica and assist in the formation of the pyloric sphincter.

The increased tonus of the pylorus is due to increased muscle tissue, as well as to the presence of a thickened mucous membrane. Owing to the sudden diminution in the quality of the muscle fibres at the junction of the pylorus and the fundus, and to the presence of the sinuous, deep folds and mucous membrane of the fundus, some animals exhibit externally a slight constriction. Sisson prefers to call this the *antral sphincter*, but it is hardly comparable to the entrance to the *antrum pyloricum Willisii of man.*

Smith (1921), summarising the position of our knowledge concerning the physiology of the dog's stomach, states that digestion mainly occurs in the pyloric dilatation (antrum) which from time to time may be cut off from the fundus so that the general body of the stomach appears to act as a receptacle for the food. There would appear to be little doubt that the fundus can act as a receptacle for foodstuffs, but the presence of a true antral sphincter is much less certain.

TABLE III.

Stomachs of dogs from dissecting room specimens.

Breed of Dog.	Estimated weight. lbs.	Estimated capacity. ozs.	Calculated capacity. ozs.
Mongrel	20	32	88
Collie	25	10	27½
Mongrel	15	6	16½
Mongrel	30	25	67
Sealyham	15	15	44
Alsatian	30	25	67
Dalmatian ...	25	25	67
Fox Terrier ...	15	16	44
Spaniel	30	16	44
Fox Terrier ...	10	8	22
Scottie	15	10	28

SUMMARY.

(1) A study of 30 dogs from the dissecting room, and of 30 dogs freshly killed, was made for the normal characters and capacity of the stomach.

(2) The water-distension-capacity of the stomach of the average dog is about 1,080 c.c. or nearly 2 pints.

(3) The physiological capacity is believed to be about two-thirds the water-distension-capacity, namely, about 720 c.c. or 26 ozs. It is suggested that the average dog's stomach cannot comfortably hold more than the equivalent bulk of 1½ pints of water.

(4) It is seen that the capacity of the stomach of the dog is approximately the same as that of man, and not three times as great, as previously stated in the text-books.

(5) The greater curvature is seen to be, on the average, 2·31 times as long as the lesser curvature for the normal empty stomach: for the fully distended organ it is about four times as great.

(6) The chief macroscopic features of the dog's stomach are recorded; special reference is made to the character of the mucous membrane.

BIBLIOGRAPHY.

(1) NEUMAYER, H. "Kapazitat d. Verdauungskanales." 1900. Quoted by Ellenberger and Baum. Handbuch der Vergleichenden Antomie der Haustiere. 16th Edition. Sprenger, Berlin, 1926.

(2) SISSON, S. "The Anatomy of the Domestic Animals." Second Edition. Saunders, 1914. Philadelphia.

(3) BRADLEY, O. CHARNOCK. "Topographical Anatomy of the Dog." Second Edition. Oliver & Boyd. Edinburgh, 1927.

(4) MILLER, WM. C. "Black's Veterinary Dictionary." London, 1928.

(5) ELLENBERGER and BAUM. "Anatomie des Hundes." Parey, Berlin, 1891.
(6) PATON and ORR. "Essentials of Veterinary Physiology." Third Edition. Green, Edinburgh. 1920.
(7) CUNNINGHAM, D. J. "Text-book of Anatomy." Second Edition. Pentland, Edinburgh. 1906.
(8) SMITH, F. "A Manual of Veterinary Physiology." Fifth Edition. Baillière, Tindall & Cox, London. 1921.
(9) BRUMLEY, O. V. "A Text-book of the Diseases of the Small Animals." Baillière, Tindall & Cox. London, 1922.
(10) GREIG, J. RUSSELL. "Veterinary Materia Medica and Therapeutics." Fourth Edition. Baillière, Tindall & Cox. London, 1924.
(11) BANHAM, GEORGE A. and YOUNG, WM. J. "Table of Veterinary Posology." Fifth Edition. Baillière, Tindall & Cox, London. 1926.
(12) FREIDBERGER and FRÖHNER. "Veterinary Pathology." Sixth Edition. Vol. I. Hurst & Blackette, London. 1908.
(13) HUTYRA and MAREK. "Special Pathology and Therapeutics of the Diseases of the Domestic Animals." Vol. II. Third American Edition. Baillière, Tindall & Cox. London, 1926.
(14) BLAINE. "Canine Pathology." Fifth Edition, revised and corrected. Longdon, Brown, Green & Longdons. London, 1851.

The Horse in Delivery Work.

"During the past few years there has been a definite reversion to horse transport for short-distance traffic, a tendency which is still on the increase," writes Mr. J. W. Parker in *The Pharmaceutical Journal*. "With all the alternative mechanical vehicles available this turn of events is perhaps difficult to understand, but that it is undeniable has been shown by evidence lately tendered before the Royal Commission on Transport, where it was pointed out that whilst ten years ago the economic radius of a horse was one-and-a-half miles, it is to-day almost four miles. This change has been brought about by the negative attitude towards mechanical transport and increasing taxation which has burdened the industry in recent years. At the present time the horse is practically the only form of transport not subject to taxation of some kind or other. Another factor to be taken into account is the increasing congestion in streets which slows down the speed of an expensive motor-van to that of a cheap horse turnout, consequently the mechanical vehicle is able to do little or no more effective work than the horse-drawn conveyance. Firms are therefore asking why they should go to the additional cost of mechanical equipment when substantially the same result can be achieved for a much more moderate outlay.

"It should, however, be recognised that the reversion to horse transport is attended with difficulty because the supply of first-rate drivers is now much more limited that previously. Modern highway services, too, are a sore trial to horseflesh because their smooth crust makes it increasingly difficult to secure a good foothold, and as a result the rate of progress is slowed down to less than an economic pace. It is probable the worst has been seen in this direction, as horse interests have at last been able to prevail upon highway authorities to consider their special needs to an extent which enables a number of new roads to have their surfaces roughened somewhat so that a better foothold can be maintained. The problem has also been tackled from another angle, by which farriers have produced a non-slip shoe designed to give a secure grip upon even the glassiest surface. It consequence of these and other developments it would appear there is still a substantial lease of life before the horse in delivery work."

"It has recently come to my knowledge that there exists among the public a rather curious misunderstanding of the terms 'pasteurized milk.' A lady said to me yesterday that she supposed that the cows which supplied this kind of milk were all fed on green *pastures* and had no dry food."—*M.H.W., in the Sanitary Journal.*

Control and Treatment of Coccidiosis.

By W. R. Kerr, M.R.C.V.S., D.V.S.M.

Coccidiosis as a disease of poultry is becoming a menace to the industry second only in importance to bacillary white diarrhœa, and though its infection is not so readily disseminated, there is not the same possibility of elimination as in the case of the latter disease.

Work on the control and treatment of the disease was carried out during the spring of the year 1930, at the Harper Adams Agricultural College, Newport, Shropshire, and the following notes are intended as a preliminary report of the results obtained.

CONTROL.

Efficiency of Chemical Disinfectants.

Experiments were set up to determine the value and efficiency of chemical disinfectants, and attempts were made to combine treatment with reasonable sanitary measures. The method used was to test the usual drugs or combination of drugs generally advised in treatment against controls of untreated birds.

Results at the moment tend to show that the only method of control which can be advised with confidence, is that of mechanical cleansing, and that disinfection by chemical means effects no control whatever; indeed, in many cases it seems to assist the sporulation of oocysts rather than destroy them.

During the tests it was evident that in some cases artificial infection had been too severe, as the subjects succumbed, and in some cases the controls fared better than the treated birds.

Treatment.—It is realised that drugs used for this purpose are limited in their action, and that results hitherto have been poor and inconclusive.

Most of them are supplied to the affected birds through drinking water, and when such bodies as mercuric perchloride, potassium permanganate, hydrochloric acid, free iodine, etc., are used, enter into organic combination with the ingesta and mucus of the crop and gizzard, and are therefore inert bodies on reaching the intestine and cæca. Others have no direct action on the parasite, but depend on symptomatic treatment, such agents as astringents, for example.

Certain results have also been claimed for the use of dried milk, and similar products which affect a change of *p*H in the intestine.

The oocyst is impervious, but digestive experiments here show that the endogenous forms are easily destroyed by certain chemicals. To achieve this, it is essential for the agent to be in a free state at the lower portion of the intestines.

The possibility of iodine in this connection seemed impressive, and experiments were carried out to find the most convenient form in which it could be effectively administered. It was decided to use the power of casein to absorb iodine for this purpose.

Casein in milk can absorb large doses of iodine by the application of heat, and it was found by experiment that this combination did not affect the hydrolysis of protein and its ultimate absorption as amino acids, and also that iodine was set free to combine with other organic matter to be passed out in the excreta.

This preparation seemed to fulfil the desired conditions, and its use was extended to field work. The combination is as follows :—

Iodine Solution.

Iodine	...	...	1 part.
Potassium Iodine		...	2 parts.
Water	...	...	50 parts.

To 1,000 c.c. of fresh or separated milk add 200 c.c. of the iodine solution ; heat until it becomes white.

This is the stock solution, and 1 pint should be added to every gallon of drinking water used. The chemical nature of the complex formed on the addition of a solution of iodine is popularly ascribed to the formation of colloidal iodine.

It is hoped that during this investigation additional evidence will be forthcoming, for or against this hypothesis.

Excellent results have been obtained by the use of this treatment on many farms in the West Midland Province, and it has been decided to continue the investigation of the mechanism of the treatment from both a physiological and chemical point of view.

The chemical side of the work has been undertaken by G. H. Botham, B.Sc., Analyst at the above College.

Case Report.

Uterine Rupture in a Heifer.

By J. M. Armfield, M.R.C.V.S., Chipstead.

Subject.—A Friesian heifer (first calf).

History.—Five days before, the animal had half climbed over a fence and had fallen back again.

At 8 a.m. there was straining ; the rectum and vulva were slightly swollen, while the *os uteri* only allowed two fingers to be inserted. Two feet of a calf could be felt through the wall of the vulva, beneath it.

At 11 a.m. the straining was still in evidence, the rectum considerably more swollen and the *os uteri* in the same condition. I rolled the cow each way, but no improvement resulted.

The case was pronounced a hopeless one, the calf having probably burst through the uterine wall and being in the peritoneal cavity.

Post-mortem.—I found the *os uteri* still closed, and could only insert two fingers ; just in front the organ was twisted and the calf's head and fore legs were protruding through a large rent in the uterus, and pointing backwards, the calf being fully formed and not at all decomposed.

Had the accident caused the twist, the twist preventing the *os uteri* from opening, with consequent rupture of the uterus from straining?

Experiments upon the anti-pellagra vitamin B2 made by the American Chemical Society indicate that fresh beef liver contains about the same amount of this vitamin as does dried yeast and ten times as much as ordinary beef (steak). In the order of their vitamin B2 content various parts of beef ranked as follows, viz., liver, kidney, heart, muscle.

The British Association.

The meetings of the British Association for the Advancement of Science, recently held at Bristol, have been noteworthy, from the veterinarian's point of view, for the presentation and discussion of an exceptional number of contributions bearing on his work and interests. Outstanding amongst these was the address delivered on Monday, September 8th, in his capacity as President of the Agricultural Section, by Dr. P. J. Du Toit, of South Africa, the event being rendered memorable to us by reason of the fact that this was the first occasion upon which the Agricultural Section had been presided over by a member of the veterinary profession. It is our intention to reproduce Dr. Du Toit's address in full in our next issue.

Dr. Bower's Address.

Professor F. O. Bower, one of the most distinguished of living botanists, following his induction into the Presidential Chair of the Association, gave his Presidential Address, in the course of which he said that in Darwin's own words, morphology, or the study of form, was " one of the most interesting departments of natural history, and might almost be said to be its very soul." As the Association had chosen for this year's President a botanist whose work had dealt specially with form in plants, the occasion seemed fit for discussing certain morphological questions which presented themselves in the eighth decade from the publication of the " Origin of Species." . . . . .

Whether there was only one original form of life or many is still an open question, said Dr. Bower. Nevertheless, among the welter of organisms rightly held as primitive, the Flagellata may with some degree of reason be named as combining in their motile and sedentary stages respectively the animal and vegetable characters. They suggest a sort of starting point from which the two kingdoms might have diverged. The probability of their common origin is strong ; but the divergence must have been early, each taking its own independent course, with increasing size and complexity of the individual. In tracing this I would ask your special attention this evening to the Kingdom of Plants.

The first of the laws laid down by Lamarck in his *Histoire Naturelle* as fundamental in evolution ran thus : " Life by its intrinsic forces tends to increase the volume of every living body, and to enlarge its parts up to a limit which it determines itself." When in unicellular organisms, following this law, a certain size has been reached, fission follows, and the equal halves separate as new individuals. In pluricellular bodies, however, the products of cell-division do not separate, but continue a communal life ; and the individual may increase, with further division of its cells, to large size and complexity.

Plants and Animals.

We may picture how, based upon the mobile stage of a Flagellate, the aggregate might form an animal body with motility as a leading feature ; on the other hand, based upon the sedentary stage, an immobile plant-body would result. The animal, adopting a predatory habit and colourless, might progress along lines of dependent nutrition, finding and ingesting food already organised ; the sedentary green plant might evolve along lines of physiological independence, constructing its own organic supplies. Whether or not this be a true picture, the whole organisation of the two kingdoms diverged on the basis of nutrition. Herbert Spencer contrasted them physiologically, showing how animals are expenders, while plants are accumulators ; that the former are limited in their growth by the balance of expenditure against nutrition ; in the latter growth is not so limited. Thus the problems that follow on increasing size may be expected to work out

differently in view of the animal kingdom comprising organisms of high expenditure and not self-nourishing, while plants are self-nourishing accumulators.

The result of this difference may be illustrated by contrasting some of the highest examples of either kingdom; for instance, the elephant with the trees of the forest through which he roams. On the one hand, the relative fewness of the mobile elephants, their less stature and compact form, their columnar legs needed to support the barrel-like body, the receptacle for ingested food, the economy of external surface and the highly developed internal surfaces. On the other hand, the height, immobility and large number of the trees, with their massive stems and highly complex shoots and roots, so necessary for acquiring food directly from the air and soil. We may further contrast the genesis of the individual in either case. In the mammal the parts are formed once for all, its embryology being an incident closed early in the individual life; but in the tree embryology may be continued for centuries, and is theoretically unlimited, except by death; during life it has the power of producing leaves and branches from every distal bud.

The fact is that, though certain underlying principles are the same for both kingdoms, the working out has been distinct from the first. Hence the morphology of plants must stand on its own feet; indeed it has been said with some degree of truth that whenever botanists have borrowed their morphological outlook from the sister science they have gone wrong. . . . . .

" Size-Factor " in Form.

After having described in detail various modes in which the form of the wood of plants was elaborated within the limiting conditions laid down by size and function, the President continued :—The somewhat technical facts thus briefly described may be taken as examples of a relation of form to size which is very general. They suggest the existence of a " size-factor," which is effective in determining form. The susceptibility to its influence resides in the part that shows the results.

The internal contours are defined *ab initio,* instead of coming into existence during the course of development, as is the case with the convolutions of the mammalian brain. In the stem and roots of vascular plants the fully-matured conducting tracts may be traced upwards, with their outlines already defined, through successive stages of youth towards the growing point, which has been their source. Their form may be seen already outlined in its young tissue closely short of the extreme tip. This fact suggests that the susceptibility to the size-factor resides in the growing point itself, for immediately below it those tracts possess that form which will aid their function when they are fully developed.

Of all the factors that contribute to the determination of form in growing organisms there is none so constant and inevitable in its incidence as this size-relation. Its operation becomes manifest with the very first signs of differentiation of the embryonic tissues. The effect of other factors that influence form, such as gravity, light, temperature, contact, and the rest appear later in point of time. Their influence is liable to diminish as the organism reacts to them by curvature or otherwise, and to vanish when the reaction is completed. Under experiment they may be controlled or even inhibited. But the operation of the size-factor is insistent; it cannot be avoided either under conditions of nature or by experiment, though the size itself may be varied under conditions of nutrition and the permeability of the presentation-surfaces may not be constant, with results as yet unknown. When we reflect that all acquisition of nourishment and transit of material in plants of primary construction is carried out through limiting surfaces, the essential importance of the size-factor is evident, for upon its influence the proportion of each presentation-surface itself depends.

The evidence that size itself is, among other factors, a determinant of form rests upon the constancy with which, in an enlarging organism, changes of primary form tend to maintain a due area of presentation-surface such as active transit demands. That evidence has been derived chiefly from the conducting tracts of primary individuals as they enlarge conically upwards, and from parts belonging to distinct categories, also from comparison of different individuals not necessarily of close alliance. Very cogent evidence lies in the variety of the changes of form by which the same end is attained. Finally, the converse facts bring conviction when, as often happens, a distal diminution of size in stem or leaf is accompanied by simplification along lines roughly the converse of those that follow increase. All this shows that a real relation exists between size and primary form.

The term " size-factor " has been used to connote that influence which affects form in relation to size, but without defining it except by its results. Nevertheless, we have seen that its action may be located in near proximity to the growing point, or in the embryo itself. It has not, however, been found possible to assign to that effect an immediate cause. The attitude thus adopted towards an undoubted factor seems justified by the broad logic of science and by the practice of its highest votaries. When Newton put together his great physical synthesis he pointed out at the close of the " *Principia* " that the cause of gravitational force was unknown. " Hitherto, I have not been able to discover," he said, " the cause of these properties of gravity from phenomena, and I frame no hypotheses." Likewise, in its own more restricted field of botanical phenomena, the size-factor may be recognised as effective in development, though the immediate cause of its effectiveness is still unknown.

The position thus adopted assumes the shoot to be a unit, not a congeries of " phytons." The elaboration of its form, whether external or internal, would be a function of the increase in size of that unit, and the results would tend to maintain the adequacy of the presentation-surfaces. This conception of the shoot and of its parts would accord with the views of General Smuts, as stated in his remarkable work on " Holism," published in 1926. Many present here to-day will have heard his address in Cape Town last year, when opening the discussion on " The Nature of Life." All will value this masterly statement in brief of his theory. I suggest that the operation of the size-factor, whether in relation to external leaf-development or in the elaboration of internal conducting tracts, illustrates that " measure of self-direction " ascribed by him to every living organism.

The President then turned to the value of the botanical expert in the service of man, observing, as Huxley told us long ago, " What people call applied science is nothing but the application of pure science to particular problems."

At the moment there is an unprecedented demand for botanical specialists to fill investigational and advisory posts at home and abroad, and there is a shortage of applicants. The realisation of this will doubtless be transmitted through the universities and colleges to the schools of the country and lead to an increased supply. On the other hand, it lies with the Government to react, as other markets do, in taking steps to equalise supply and demand. A condition of the success of a specialist will always be a thorough foundation upon pure science, and this will be fully realised in the selection of candidates. Government, whether at home or in the wider Imperial field, can make no better investment than by the engagement of the best scientific experts available. In respect of botany this has been attested by many well-known instances.

The Crookes Wheat Forecast.

Some reference will naturally be expected here to the remarkable address given by Sir William Crookes in 1898, when the association last met in Bristol. He then forecast that, in view of the increase in unit-consumption since 1871 and the low average of acre-yield, " wheat cannot long retain its dominant position among the foodstuffs of the civilised world. Should all the wheat-growing countries add to their area to the utmost capacity, on the most careful calculation the yield would give us only just enough to supply the increase of population among bread-eaters till the year 1931. The details of the impending catas-

trophe," he remarked, " no one can predict, but its general direction is obvious enough." The problem is one of applied botany, with a setting of world economics and a core of physical chemistry. After raising the spectre of wheat-shortage before the eyes of his audience in 1898, Crookes laid it again by the comforting words, " The future can take care of itself. The artificial production of nitrate is clearly within view, and by its aid the land devoted to wheat can be brought up to the 30 bushels per acre standard."

We who are living within a few months of the fateful year of 1931 are unaware of any wheat-shortage. Sir William Crookes' forecast of 1898 as to the advance in the production of combined nitrogen has been fully realized. Artificial fertilizers are not in view only, but at hand and in mass. Moreover, the northern limit of successful wheat-culture has been greatly extended by the production of new strains with ever shortening period between sowing and reaping, while the establishment of new varieties is extending the productive area in South and West Australia into regions where the rainfall is of short duration, and restricted in amount.

The future, since 1898, has indeed taken care of itself; so that, notwithstanding the warning of so great a man as Sir William Crookes, the wheat-eating public is still able to sleep well at night so far as the wheat-shortage is concerned. What better example than this could we desire, not only of the importance of applied botany, but as showing also how its advance follows on research independently pursued? For the production of synthetic nitrogen, which has now become a commercial proposition, and the improvement of the strains of wheat by selective breeding along Mendelian lines, are both involved in solving this crucial question of food supply. And both owe their origin to advances in pure science.

After paying tribute to the memory of Lord Balfour, especially for his origination of the Department of Scientific and Industrial Research and the Cabinet Committee for Civil Research, the President concluded:—And so in this hundredth year of its existence, the British Association sees research recognised and fostered in the service of the State in a way never dreamed of in 1831, when a small body of enthusiasts met at York for the advancement of science. But though the individual seeker after truth may thus be involved in official harness, as of old an inner voice will yet speak to him. He will himself be as near to Nature to-day as he was in the simpler days that are gone.

. . . .

Classification of Animals.

The Determination of Species.

Dr. W. T. CALMAN, President of the Section of Zoology and Keeper of Zoology at the British Museum (Natural History) discussed the naming and identification of animals.

He said that the systematist was generally supposed to be a narrow specialist, concerned with the trivial and superficial distinctions between the members of some narrow group of organisms which he studied in the spirit of a stamp collector. There was some truth in such criticisms, but those who were concerned with the applications of zoology to practical affairs were for the most part aware of the need for exact identification of the animals they dealt with, although they did not always recognise the difficulties.

When Linnaeus published, in 1758, the first volume of the tenth edition of his " Systema Naturæ," he named and described about 4,370 species of animals. If they were asked how many were known to-day the diversity of the answers gave some indication of the confusion that existed. A colleague at the Museum had told him that the number of species of mammals was "anything from 3,000 to 20,000 according to the view you took of what constituted a species." He was not sure but that these divergencies were over-estimated. It would be found that in most orders of animals there existed a considerable body of species regarding whose limits there was no serious difference of opinion among competent specialists, but alongside these there were in almost every order, in most families, and even in many genera a difficult residue in which the delimitation of specific groups was little more than a matter of personal taste.

Unfortunately, as his colleagues informed him, there were great sections of groups so imperfectly surveyed that it was impossible even to guess how many of the supposed species that had been described would survive reconsideration. The torrent of publications catalogued in the Zoological Record increased year by year, and the specialist, if he were not to be overwhelmed by it, could not allow his curiosity to stray beyond the limits of a narrow corner of the field.

By far the greater part of this literature, he continued, is written by specialists for specialists, and much of it is unintelligible to anyone else. From the time of Linnaeus, however, there have not been wanting publications that have a different aim. We have monographs, synopses, revisions, of all sorts and sizes, attempting to render possible the identification of species without demanding a life-time of study for each special group. The ideal for such monographs would be, I assume, that they should be intelligible to, and render possible the determination of species by, any properly trained zoologist, even without previous experience in dealing with the particular groups of which they treat.

Work of British Museum.

The Zoological Department of the British Museum may fairly claim to have done more towards this re-editing of the " Systema Naturæ," than any other institution in the world. The long series of monographs, of which the true character is somewhat concealed under the official title of " catalogues," is a monument to the learning and industry of the great zoologists who planned and executed them. Though they remain indispensable to all serious students of the different groups, however, they are now, for the most part, long out of date, and, vast as is their scope, they cover only a fraction of the animal kingdom.

In 1896, the German Zoological Society began the publication of " Das Tierreich," afterwards continued by the Prussian Academy, which was planned to give nothing less than a revision of all the species of living animals. Here again, however, after 34 years, only a small part of the ground has been covered, and already the progress of research has rendered many of the earlier parts obsolete. Colonel Stephenson tells me that Michaelsen's revision of the Oligochaeta, published in this series in 1900, deals with exactly half the number of species enumerated by the same authority in 1928.

Apart from these attempts at comprehensive revision, we have, of course, numerous surveys of local faunas on a larger or smaller scale, besides monographs of restricted groups, but hardly ever do these fit together without leaving gaps, geographical or systematic.

One cause that has encumbered systematic literature with uncounted pages of useless writing is the prevalent delusion that it is possible to give what is called a " complete description " of a species. . . Now a moment's reflection will show that a lifetime would not suffice for the " complete description " of any animal whatsoever, and, on the other hand, a very little experience will convince one that it is impossible to predict the kind of characters that will distinguish the next new species. . .

Description.

If every one who describes a new species were to restrict himself to a bare enumeration of the characters in which it differs from all the known species of its genus, systematic papers might be vastly diminished in bulk, although one suspects that the labour necessary to write them might be correspondingly increased. It may be a counsel of perfection to suggest that no one should introduce a new

specific name without undertaking at least a partial revision of the genus including it, but there are very many instances where the multiplication of species might with advantage be postponed until we learn something about those that are supposed to be "known."

The number of described species of animals has been estimated at something in the neighbourhood of three-quarters of a million. It is not at all improbable that between a quarter and a third of that number would be suppressed as synonyms or put aside as "species inquirendæ" by careful monographers, and that in many groups the proportion would be far higher.

The prospect is not one that can be contemplated with any satisfaction. The successively expanding volumes of the "Zoological Record" give us a picture of systematic zoology being smothered under the products of its own activity. The confusion will grow steadily worse unless systematists come to realise that the mere description of new species is a far less important thing than the putting in order of those that are supposed to be already known, and until, on the other hand, zoologists in general cease to regard taxonomy as a kind of menial drudgery to be done for them by museum curators.

Detection of Watered Milk.

Mathematical Tests.

Dr. J. F. Tocher, of Aberdeen, in discussing the adulteration of milk by water in the Agricultural Section, said that the present law was unjust to the seller and had created an impression that the public analyst could always tell when milk had been watered. Even at the present day it was not possible for an analyst to state, as the result of analysis, the percentage of water added in an adulterated sample. Nevertheless, the regulations imposed, and still impose, upon the seller of milk the necessity of proving his innocence in Court when a sample of milk, sold by him, fell below three per cent. butter fat or below 8·5 per cent. solids-not-fat. The seller of such a milk came into Court a guilty man, because it was presumed, until the contrary was proved, that the seller had been watering his milk. It was, however, now an established fact that proportions ranging up to 14 per cent. of all genuine samples fell below three per cent. in butter fat and proportions ranging from 22 to 30 per cent. of all genuine samples fell below 8·5 per cent. in solids-not-fat.

After discussing the advantages of a legal standard, the difficulties in connection with bulking and various tests of watering, including the freezing point method, he explained the basis on which he proposed to elaborate a criterion for watering. The problem was not analytical but mathematical in character. He explained that he found the proportions of the various constituents of milk to be quite different for low values of total solids, when compared with the proportions of these same constituents for high values of total solids in genuine milk. For low values of total solids milk sugar contributed largely to any increase, while, for high values, casein contributed more than any other constituent.

The first stage in the process was to obtain an equation which would determine with high probability the fact of watering, while the second stage was the development of a function, based on the actual variation of the constituents, the values of which would indicate the various degrees of watering. Unfortunately the second stage was a long one, involving more than 18 months' calculations in order to find the values of 15 constants which would have to be used by analysts when they desired to calculate the percentage of watering. He gave examples of preliminary tests of watering and showed that the criterion was likely to be of a practical character, giving values reasonably near the actual amount of watering in known mixtures of milk and water.

Review.

[**Practical Veterinary Pharmacology, Materia Medica and Therapeutics.** H. J. Milks, D.V.M., Professor of Therapeutics and Director of the Small Animal Clinic, New York State Veterinary College, Cornell University. Published in England by Baillière, Tindall & Cox. Price 28s.]

This work is the second edition of a well-known text book on Veterinary Materia Medica. The text has been revised and re-written and contains some new material, chiefly the barbital group of sporifics, the aniline dye group of antiseptics, some of the new local anæsthetic preparations, and the more recently introduced anthelmintics, carbon tetrachloride and tetrachlorethylene.

The work is, no doubt, prepared to meet the requirements of students at American Veterinary Schools, and, in this respect, contains much of the material set out by the syllabus of the R.C.V.S. on this subject. The preparations in the Materia Medica, however, conform to the U.S., and not the British Pharmacopœa, and many will appear strange to English veterinarians.

The opening chapters deal comprehensively with pharmacy, dispensing and prescription writing.

The drugs are grouped in accordance with their pharmacological actions and therapeutic uses, and this would appear to be superior to the older method of classifying the vegetable kingdom according to the natural order of the plant. One disadvantage of the therapeutic grouping is that it gives rise to repetition.

The doses mentioned are, in general, orthodox.

In his preface, the author states that he claims little, if any, originality in the material included and that he has drawn freely from current literature and standard books on the subject. Many of the references in pharmacology are taken from Cushny.

The chapter on anthelmintics has been revised by Maurice C. Hall and W. H. Wright, two accepted authorities on the subject. Carbon tetrachloride and tetrachlorethylene receive considerable attention and dosage has been carefully computed according to body weights. Many of the other agents, however, particularly, areca, male fern and oil of chenopodium, are dealt with in a very cursory fashion, with little or no reference to toxicity. In this connection we feel that the subject of toxicology in relation to drugs, might have received more attention. It is to a book of this nature that one turns for reference as to toxic doses.

The subject of biological therapeutics is dealt with by Dr. Eichhorn. It commences with a short and useful treatise on the subject of immunity and follows by explaining the practical indications and application of serum and vaccine therapy. A series of photographs illustrates the chapter on diagnostic products.

The task of preparing a complete comprehensive work on the range of subjects dealt with by this book, is a formidable one and we would congratulate the author upon the manner in which he has dealt with it.

Abstracts.

[**Diagnosis of Pregnancy in the Cow by Means of the Alcohol Test.** LINKES, G. (*B.T.W.*, No. 15, 1930).]

The cow's milk is used for this purpose, with the following technique. A shallow glass vessel is filled one-quarter full with milk to be examined and an equal quantity of absolute alcohol added. After shaking a little the vessel is allowed to stand for from 15 minutes to 3 hours and is then examined. In doubtful cases it may be left for a further 12 hours.

Normal milk from a healthy, non-pregnant cow does not show any coagulation, but that from a pregnant cow does become altered by the formation of coagula (positive reaction). After shaking, these coagula adhere to the edges of the glass and in the later months of pregnancy take on a curd-like consistence. The writer has had regular results with this test and considers it to be of value in combination with the other means of diagnosing pregnancy. This reaction to absolute alcohol—coagulation—also occurs with other kinds of milk. Tainted market milk is demonstrated by it and both physiological and pathological stimuli can bring about a positive reaction (coagulation). It lies with the veterinary surgeon to interpret the true result by estimation of the purity of the milk used.

Œstrum, pregnancy and processes in connection with parturition cause a positive reaction. In conflict with opinion held elsewhere, the writer believes that the method yields regular results and is useful in diagnosing a pregnancy of 21 days or of longer duration.

According to Friedberger and Fröhner, milk of cows which have aborted three weeks previously, coagulates.

The writer discusses the matter from a bio-chemical aspect and quotes a number of other workers in illustration. The physiological principles concerned are still somewhat obscure.

J. T. E.

[**A Contribution to Modern Cardiotonic Therapy.** Dr. Böhmer, Rostock (*B.T.W.*, No. 16, 1930).]

The introduction of *Folia digitalis* into human and veterinary pharmacology furnished an indispensable drug, but since that time chemists have been able to analyse the plant and have found that it contains some glucosides that have a great therapeutic value. The most valuable is digitoxin (C_{34} H_{54} O_{11}).

It can be prepared in a very pure state but has the disadvantage that it should be given intravenously. Digitalein, on the other hand, discovered by Schmiedeberg, is equally suitable in subcutaneous, intramuscular or intravenous administration. (It is made in Germany as a proprietary drug). As regards indications and application of digitalis in practice, it is called for in all organic heart diseases. Its action on the heart and circulation is undisputed; the simplest form of employment is as the Infusion, which must be freshly prepared, and, should stomach disorder exist, it may be given *per rectum*. Digitalis medication will not stimulate a heart badly diseased; the heart must be at least 50 per cent. efficient in order to benefit. Intramuscular administration gives rapid results and subcutaneous application is not recommended as it may set up local injury (œdema).

The effects of intravenous administration are naturally the most rapid, but the technique is not so simple. The toxic effect of digitalis when given several times must not be forgotten; an overdose causes sudden stoppage of the heart during systole.

The writer now discusses caffein, which he says is indicated in cases of sudden collapse as a life-saver rather than as a tonic, whilst digitalis is vagotonic and leads to a bradycardia, which is very desirable in tachycardiac decompensation. In practice, during infectious diseases, there often occur cases of organic heart disease accompanied by decompensation. In such cases digitalis-caffein is indicated.

A firm of drug makers have prepared a combination of full doses of digitalis and caffein, which the writer favours. The digitalis slows the pulse and produces a longer diastole and makes the heart beat more strongly. As, however, this action may be excessive and slow the pulse very much, caffein is also added to counteract this and the sum result is said to provide an optimum treatment for the condition.

This recommended combination of both drugs is the main point of the article, but the writer also reviews the actions and indications of other cardiac tonics and general stimulants—such as camphor (including hexeton), squills, strychnine, ergot and quinine. Strong dextrose solutions are also said to be of use, particularly for dyspnœic trouble.

J. T. E.

The Numbers of Medical Students.

The very informative educational number of the *British Medical Journal*, issued on September 6th, contains the following note relative to the numbers of medical students:

"At the close of the last century the annual entry of medical students in Great Britain and Ireland had been on the average about 1,800, and then for the next thirteen years it stood at about 1,400. During the war period, although many students left to serve with the forces, the entries grew steadily larger, so that in 1918 they were 2,253, and in the following year, when demobilization was in active progress, they were 3,420. In the next five years the numbers rapidly fell, but from 1923 to 1928 they remained at a fairly steady level rather below the immediate pre-war average. In 1924 the entries were 1,043; in 1925, 1,070; in 1926, 1,260; in 1927, 1,214; and in 1928, 1,362. Last year they rose again to 1,502.

"The excessive entries during the post-war inflation period, if they had gone on long enough, must have led to over-stocking of the profession. In the past decade the numbers of new practitioners registering each year have greatly exceeded the usual pre-war figure of eleven hundred or so. The large additions to the profession in recent years brought the total number of names in the *Medical Register* up to 54,870 at the end of 1929. This is upwards of ten thousand more than the figure for 1919, fourteen thousand more than that for 1909, and nineteen thousand more than that for 1899. The population of the British Isles has not increased at anything like that rate during the same decennial periods, and the ratio of doctors to inhabitants is therefore much higher now than ever before. It should be borne in mind, however, that the scope of medical practice has enlarged considerably in the meanwhile, and many fresh openings for professional work have followed advances in diagnostic, curative, and preventive methods, and the rapid development of administrative medicine. On the whole, it appears that the medical profession of this country is now large enough, but not yet overstocked."

Reports.

West Riding County Council, Veterinary Department.
Annual Report of the Chief Veterinary Officer, 1929-30.]

The third annual report presented by Major D. S. Rabagliati, in his capacity as Chief Veterinary Officer to the West Riding County Council, to his Public Health and Housing Committee reminds us that it was the decision of the Committee to institute a regular veterinary inspection of all dairy cows on the registered milk producers' premises in the West Riding, together with the great amount of work necessary under the Tuberculosis Order of 1925, which was responsible for the formation of a Veterinary Department in the County Administration.

The progress of this Department, under the able leadership of Major Rabagliati, has been followed with interest and appreciation by all who desire to witness the establishment of a competent, efficiently-organised and adequately-staffed Local Authority veterinary organisation is this country.

The report reflects the steady growth in staff, efficiency, and results we had expected to find. Commencing in 1927 with one chief and four assistant veterinary officers and one clerk (all whole-time officials) and a panel of 24 part-time men, the Department now boasts, in addition to its head, eight Assistant Veterinary Officers, the administrative area being now divided up into eight inspectorates, each being a more or less complete unit in itself, and in each inspectorate there are one or more part-time veterinary officers on a panel available to be called upon by the Chief Veterinary Officer or Police Superintendent in case of special emergency—if for instance a severe outbreak of foot-and-mouth disease should occur or any other occasion arise to necessitate their services being required.

The year under review is the first in which regular routine veterinary inspection has been carried out on all milk-producing cows in the administrative county area for a consecutive 12 months. The scheme, which was only in force over about a half of the county area the year before, was extended to embrace the whole county when additional staff was appointed in the autumn of 1928.

"In the short time that regular inspections have been carried out the results have shown that their institution was well justified, not only from the number of dangerous cows that have been removed from herds, but also, from the distinct improvement shown in the methods of milk production in many areas and the general interest these inspections produce amongst all concerned. Another pleasing aspect is that several local sanitary authorities have asked that the veterinary inspections should be carried out more frequently, showing how much they appreciate their utility. As far as possible arrangements have been made to meet their wishes."

A not unimportant factor in the smooth working of the machinery is recognised with hearty sincerity by Major Rabagliati in the words: "I would once again like to express my thanks to the members of the West Riding Constabulary for their unfailing help given both to me and members of my staff whenever asked for."

So far as scheduled diseases are concerned, there were no outbreaks of rabies or glanders—the latter a matter of some gratification where large numbers of pit ponies are concerned—while of 88 suspected cases of anthrax six only were proved to be positive.

The number of confirmed outbreaks of sheep scab, unfortunately, showed a considerable increase, 39 having occurred against 13 in the previous 12 months. The author re-stresses the necessity of voluntary and systematic double-dipping and adds: "It would be well if all farmers would realise that the officials of the authorities concerned are only too anxious and willing to give them any help and advice in their power, for the total eradication of this disease."

The West Riding, unfortunately, suffered like many other areas in England from the great increase in swine fever, no less than 90 outbreaks being confirmed, against 46 in the previous 12 months and 96 in the year before.

The Chief reports with gratification that for two years in succession no fresh outbreak of foot-and-mouth disease has occurred in the West Riding administrative area, and for the first time for several years no restricted area has been imposed by the Ministry of Agriculture on any part of the county.

Tuberculosis.

The administration of the Tuberculosis Order, 1925, has continued to be one of the main functions of the staff, and, "worked along with Part IV of the Milk and Dairies Order, of which it may almost be considered an integral part, has proved of inestimable benefit in ensuring the destruction of cows found on routine dairy inspection to be suffering from scheduled forms of tuberculosis."

The following statistics of cases dealt with, compared with those of the preceding year, are interesting and instructive:—

	1929-30.		1928-29.	
Number of premises on which "disease" was notified ...	*1,043		981	
Number of premises on which "disease" was found to exist	801		780	
Number of premises on which "disease" was found not to exist	†242		201	
Number of cattle slaughtered as diseased:—				
Cows in milk	652		498	
Dry cows and heifers ...	165		294	
		817		792
Other bovines		15		17
		832		809
Cattle on premises visited ...	21,199		23,542	
Cattle clinically examined ...	18,251		16,870	
Cattle slaughtered	832		809	
		%		%
Disease found to be "Advanced"	483	58·1	555	68·6
Disease found to be "Non-Advanced"	344	41·3	249	30·8
Negative	5	·6	5	·6
		%		%
A.—Cows with tuberculosis of the udder	291	35·1	226	28·2
B.—Cows giving tuberculous milk and showing lesions of tuberculosis	1		2	

* Affecting 1,096 cattle.
† Involving 259 suspected cattle.

" In surveying the result of the year's work, the most satisfactory feature is the high percentage of cows detected and slaughtered with udder tuberculosis. This figure of 35·1 per cent. of all animals slaughtered under the Order, as against 28·2 last year, and 16·2 the year before, is largely due to routine inspection of cows, for but few were reported by their owners. The returns on the working of the Tuberculosis Order issued by the Ministry of Agriculture for England and Wales for the year 1928 (the last available figures) for the similar category show only 16·5 per cent. of the total killed, including cows whose milk was proved to be tuberculous. In addition to the 292 cows with udder tuberculosis, or giving tuberculous milk, seven udder cases were detected in boroughs during inspection under the Milk and Dairies Order and reported to the Borough Authority concerned and three were killed by their owners at their own risk. This gives a total of 302 cows slaughtered whose milk was highly dangerous, and if each cow could infect, say, 10 children when its milk was mixed on the farm (a moderate estimate), the benefit to the milk-consuming public is well apparent. It must be admitted, however, that many were only detected when they had already been milking for some time, and it is impossible to say what damage they may have done previously.

" It must not be assumed that the number of cattle dealt with under this Order is a true statement of the extent of the disease, for there is still ample evidence to show that many badly tuberculous cattle are sent directly to the knacker, or otherwise disposed of by farmers . . . .

" The greatest importance should be placed on having the owners present at *post-mortem* examinations if possible, especially in the case of apparently healthy cows affected in their udders. The educational value cannot be overestimated and the fact that " seeing is believing " usually allows the owner to go away feeling that he has not been unfairly dealt with, even if he is disappointed in the amount of compensation he draws. The veterinary staff always goes out of its way to make *post-mortem* examinations as far as possible at times to suit owners of animals condemned, and the little extra trouble involved has been more than made up for in the better understanding between the farmers and the staff.

" Reference was made in my last report to the great benefit which would accrue by farmers insuring milk cows against losses under the Order in the case of tuberculosis of the udder. Two meetings were arranged between the Chief Veterinary Officer and officials of the National Farmers' Union to discuss this matter. Unfortunately, the Farmers' Union has not seen its way to take any further action up to now.

Much valuable work performed under the Milk and Dairies (Consolidation) Act, 1915 (detection of tubercle bacilli in milk) and under the Milk and Dairies Order, 1926 (inspection of cattle) is also recorded. As a direct result of the inspections 364 cows have been taken under the Tuberculosis Order, 187 of which had tuberculous lesions in their udder and without such inspections the great majority of these would have gone undetected.

Great improvement is reported in the conditions under which milk is produced in the Riding.

[**City of Liverpool.** Report of the Chief Veterinary Officer on the Work of his Department for the Year 1929.]

If cattle supply the main *motif* in Major Rabagliati's report, those who pick up Mr. Eaton Jones' report for study (which it is well worth) will be aware that pride of place will be given to the data relative to the magnificent stud of horses for which he is responsible to the Health Committee of the Corporation of Liverpool.

At the commencement of the year the Health Committee's stud numbered 359 horses. During the year 55 were added and 47 disposed of, the stud, therefore, comprising 367 animals at the end of the period under review.

The mortality figures and the number of ineffective animals remain, as for many years past, extremely low.

It has been the custom of the Health Committee to enter horses from its stud for competition at the various Agricultural Shows, these entries being considered to encourage the breeding of good horses and also serving to draw the attention of agriculturists and others to the Committee's stud. Many successes have been recorded at these Shows, and during the year, out of a total of 14 entries, the Corporation horses gained 2 firsts, 7 seconds, and 5 thirds.

The Committee's horses have also been very successful at the Annual Liverpool May Parade of Horses, and for a number of years practically every premier award for which they have been eligible to compete has been gained. The sums gained in these competitions have generally been devoted by the Health Committee towards the funds of the Liverpool May Parade, which is promoted for the benefit of the City and the expenses of which are defrayed by public subscription and by the above-mentioned prize money.

DRIVERS FREEDOM FROM ACCIDENTS COMPETITION.

The Health Committee has supported the National Safety First Association in its endeavours to reduce the prevalence of street accidents and, with this object in view, the regular drivers employed by the Department have been entered in the " Freedom from Accidents Competition." Under this scheme a diploma is granted by the Association to each driver for each year of freedom from blameworthy accidents, and the award of five diplomas in consecutive years entitles the winner to a silver medal. A bar to this medal is given for each additional year. During the year out of 263 drivers entered 231 qualified for the award of a diploma.

Another activity which is surely of much more than local interest and significance is the training given to a large number of boys in stable management, in connection with the Liverpool Sheltering Homes (Dr. Barnardo's Homes Emigration Scheme), which ensures the possession of some knowledge of horses when these lads arrive in the Colonies.

It is interesting to note that two-thirds of the papers prepared for the technical journals by officers of the Department during the year appeared in the columns of the *Veterinary Record*.

TUBERCULOSIS.

During the year 25 cases of tuberculosis of the udder were detected among City cattle (which include 3,995 dairy cows), in addition to various other forms of scheduled disease. Of the udder cases, 12 were found during routine clinical examination, five were reported as suspect by the

respective owners, eight resulted from bulk samples of milk taken by the Medical Officer of Health's Department being tuberculous.

Of 55 cows notified by the owners or their veterinary surgeons as suspected, five proved to have tuberculosis of the udder, and 14 tuberculosis in other notifiable forms.

Of 327 samples of milk taken by the Medical Officer of Health's Department, 13 were referred to the Chief Veterinary Officer as tuberculous, consequent examination of the involved herds resulting in the detection of eight cases of tuberculosis of the udder. In the remaining five cases, the supplies were proved to be non-tuberculous on the day of the examination of the herd, showing that the diseased animal had been removed or that the contamination had ceased.

A number of cattle were also dealt with under the Tuberculosis Order of 1925 as suffering from reportable forms of the disease other than in the udder.

"There is a growing feeling among local cowkeepers," says Mr. Eaton Jones, "that it is worth while as advertisement and for the general health of their cattle, to buy in only cows that have passed the tuberculin test, but that it is not practicable to take out a licence for Graded Milk under the Ministry of Health Scheme.

"It is noteworthy that a Liverpool cowkeeper headed the list of herd averages for the year 1928-9 in the Lancashire County Milk Recording Society, and that another was fourth. Also, that a Liverpool cow won the Milking Trials at the Royal Lancashire Agricultural Society's Show."

Taking the estimated cattle population of the City at 3,995, the figures for 1929, given in the report, show that each animal was examined approximately three times during the year. "The value and importance of routine veterinary examination of the herds in the City cannot be too highly emphasised, as clinical examination of the animals, *plus* microscopical examination of the milk, now results in the detection of tuberculosis, and the slaughter of the affected animals, within a day or two of the visit as against a delay of from four to five weeks while awaiting the result of biological tests. Examination of the herds, at least once every three months, is desirable."

The following table shows the number of animals dealt with during 1929, and the form in which they were diseased :—

Total number of animals examined.	Number Slaughtered.	No. with Tuberculosis of udder.	No. giving Tuberculosis Milk.	No. with Tuberculous emaciation.	No. with chronic cough and definite signs of Tuberculosis
842	47	23	—	4	20

	£	s.	d.
Compensation refunded by Ministry	217	6	3
Amount of salvage recovered by sale of carcasses	111	17	8
	£329	3	11

	£	s.	d.
Compensation paid to Owners	291	4	8
Credit balance to Local Authority	37	19	3
	£329	3	11

N.V.M.A. Divisional Report.

Royal Counties Division.

Visit to the Royal Agricultural College, Cirencester.

A day of uninterrupted sunshine—the heat tempered by a breeze—favoured the summer meeting of this Division, for which the President (Major A. C. Duncan) had arranged a highly-attractive programme in his own Cotswold country on Friday, July 25th, 1930. The centre of activities (reached by most after an exceptionally long but pleasant motor journey) was the Royal Agricultural College, Cirencester, an imposing institution in which, to quote from a resolution of inception passed by Circencester citizens in 1844 "the rising generation of farmers receive instruction in those sciences a knowledge of which is essential to successful cultivation." The kindly offices of the College Staff were scarcely needed to bring home to the visiting party, by force of comparison with another institution, the value of worthy buildings and equipment in fulfilment of the functions for which the College was founded.

There were present the President (Major A. C. Duncan), Mr. H. Adams, Mr. and Mrs. J. R. Baxter, Mr. A. J. Beeson, Mr. Philip S. Brown (College Warden), Miss Ann Buttyant, Mr. and Mrs. J. C. Coleman, Major J. J. Dunlop and Mrs. Dunlop, Senr., Mr. E. J. Heather, Mr. J. R. Hewer, Mr. N. P. Male, Mrs. G. P. Male, Mr. G. S. Sutton, Major F. J. Taylor, Mr. J. F. H. Thomas (Vice-Principal) and Mrs. Thomas, Lieut.-Colonel and Mrs. G. K. Walker, Mr. and Mrs. E. Wilkinson and Mr. H. Bell (Hon. Secrétary).

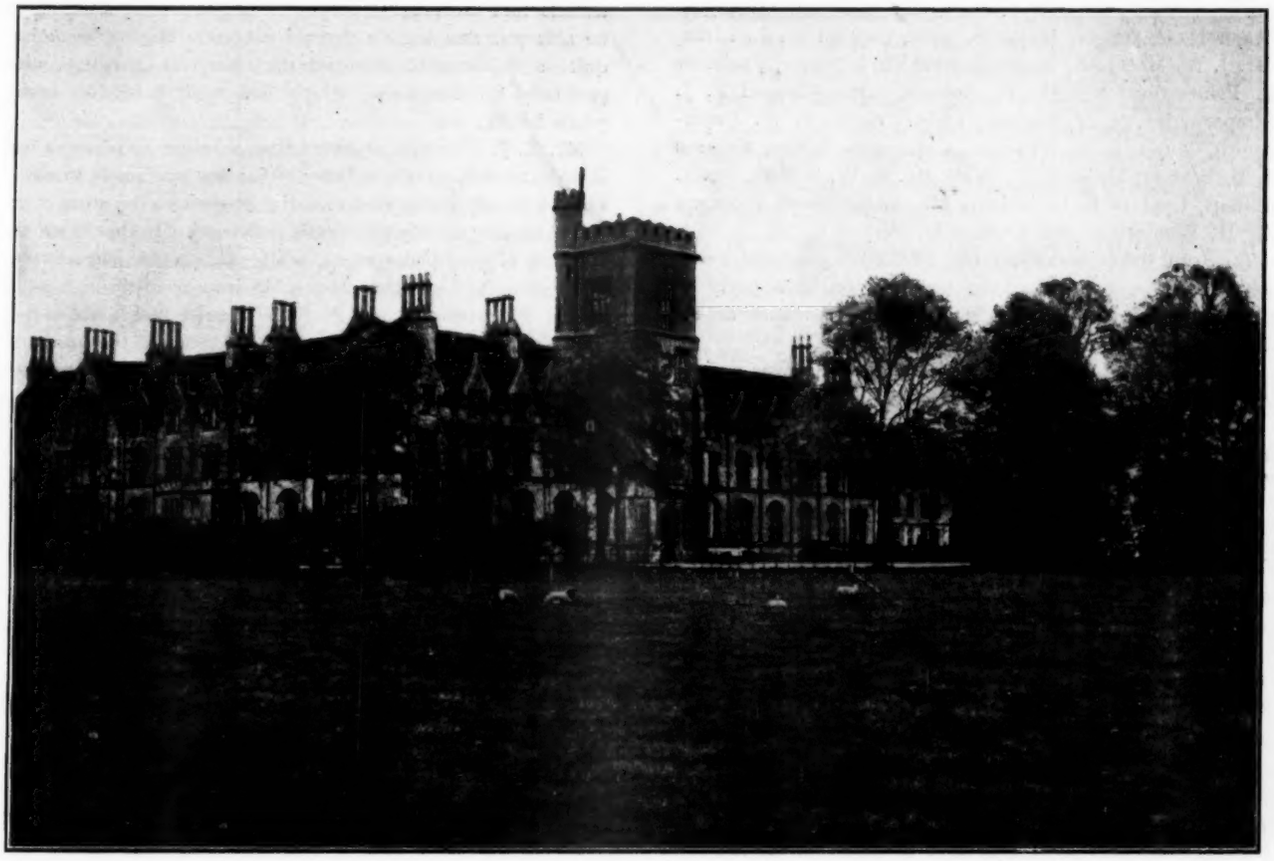
At the outset, the party were conducted round the College buildings by the College Warden (Mr. P. S. Brown) and the Vice-Principal (Mr. J. F. H. Thomas) outstanding memories being of the magnificent dining hall, the spacious well-equipped library, a wonderful old tithe-barn now adapted as a theatre, and the stately College chapel.

At this stage an outline of the history, work, and aims of this interesting institution (to which we are indebted to Mr. J. F. H. Thomas, B.SC., N.D.A., the Vice-Principal of the College) may not be out of place.

Situated about one mile to the south of the town of Cirencester is the oldest Agricultural College in Great Britain, an impressive building in the Gothic style dating back to the year 1845.

This College owed its conception to an address given by the late Mr. Robert Jefferys Brown to the Cirencester and Fairford Farmers' Club in 1842, his subject being "The Advantages of a Specific Education for Agricultural Students." Subsequently at a public meeting held in Cirencester in 1844 it was decided to found an institution to fulfil that purpose, and a strong committee was appointed to determine the best means of establishing a College. A Royal Charter was obtained in 1845 and in that year the College was opened, whilst further supplemental Charters were obtained in 1849 and 1870, and finally in 1880 Her late Majesty the Queen in Council conferred on the College the title of which it may be justly proud—"Royal Agricultural College."

From the years 1845-1915 the College passed through



ROYAL AGRICULTURAL COLLEGE, CIRENCESTER.
SOUTH-WEST FRONT.

some periods of vicissitude (mainly financial) but performed noble service in the pioneer work of education in the sciences allied to the practice of agriculture. Many very famous men were associated with the College, either on the staff or as students. On the walls of the College Dining Hall are inscribed the names of those students who have been awarded the College Diploma, a magnificent record from 1847 until the present day.

Owing to the outbreak of the War in 1914 it was necessary to close the College, but as a result of much effort and general financial support by old students, the town and district of Cirencester and the Ministry of Agriculture, it was possible to re-equip and re-open the College in 1922.

The curriculum now includes a One Year's Short Course in General Agriculture, a Two Years' Diploma Course in Agriculture and Estate Management, and a Three Year Course for the degree of Bachelor of Science of Agriculture in conjunction with Bristol University. The practice of agriculture is above all things a progressive one, and without decrying the magnificent achievement of the early scientists interested in Agriculture, one has to realise the necessity, under present day conditions, of regarding agriculture as an art to which the best of business methods must be applied. Consequently the present curriculum has been made as up-to-date as possible: agriculture and estate management are being studied from not only the scientific, but also the economic standpoint.

Finally, any educational institution must have other aims than the provision of a purely technical education. There must be an "atmosphere" of public spiritedness and of sportmanship. There has never been a greater need for young men of character and enterprise than at the present day. The Royal Agricultural College had a great tradition at the end of last century, and that tradition must be upheld now and in future years.

The Business Meeting.

When the tour of the premises was at an end, the members held a short business meeting, while the ladies enjoyed the delights of the extensive College garden.

The PRESIDENT (Major Duncan) introduced this part of the proceedings by saying that, as all the members knew, they were there that day by the kindness and courtesy of the Principal and Staff of the Royal Agricultural College. He desired personally to thank them all for coming so far to attend that meeting, but he hoped they would feel that they had been rewarded for their trouble already (hear, hear), while they had yet before them the pleasure of seeing some typical Cotswold country.

The minutes of the previous meeting, which had been published in the *Record*, were taken as read and were confirmed and signed.

Correspondence.—(1) Letters regretting their inability to attend the meeting from Mr. G. P. Male (President, N.V.M.A.), Mr. J. H. L. Addis, Major W. K. Barron, Mr. J. Bell, Mr. R. E. C. Bullen, Professor J. B. Buxton, Mr. J. Carless, Mr. E. G. Chamberlain, Captain H. B. Collett, Mr. T. M. C. Cundell, Mr. C. H. Ducksbury, Major

G. W. Dunkin, Captain T. M. C. Hunt, Mr. C. P. Inglis, Major H. C. Jagger, Major H. Kirk, Captain W. L. Little, Mr. J. W. McIntosh, Major-General Sir J. Moore, Professor S. Pennington, Mr. H. L. Roberts, Lieut.-Colonel P. J. Simpson, Mr. S. H. Slocock, Lieut.-Colonel P. W. Dayer-Smith, Major R. C. Tennant, Captain S. Villar, Captain J. B. Walker, Major R. F. Wall, Mr. F. W. Willett, Mr. J. Willett, Captain E. C. Winter, Mr. A. E. Wood, Professor G. H. Wooldridge and Captain D. Wyllie.

(2) From the General Secretary of the International Veterary Congress, suggesting the organisation of a party or parties of members for the purpose of attendance at the Congress.

In view of the proximity of the Congress, it was decided that members should make their own arrangements.

Membership Nominations and Elections.—The PRESIDENT nominated Mr. N. P. Male, of Reading (seconded by the HON. SECRETARY) as a member of the Division.

Messrs. G. S. Sutton, of the Ministry of Agriculture (proposed by Mr. HEATHER, seconded by Major TAYLOR) and T. B. Yarrow, of Swindon (proposed by Mr. COLEMAN, seconded by Mr. HEWER) were unanimously elected to membership.

Next Meeting.—On the proposition of Colonel WALKER, seconded by Mr. HEWER, it was agreed to hold the next meeting of the Division in London.

INTERESTING CASES.

Mr. J. R. HEWER drew the attention of members to the five months old Dalmatian puppy which he had brought with him to the meeting, and which had three hammer toes on the near fore foot. He had been asked to relieve the condition, and the opinion of the members whom he had asked as to the method they advised appeared to be that he should remove the toes in preference to cutting the tendons.

The PRESIDENT exhibited an aged spaniel which had been brought to the meeting at the request of the Medical Officer of Health, who was a great friend of his. It was a dog which had kept him awake for years (laughter)—not because it barked but because it had got a number of small tumours all over its body; that, however, was not an extraordinary thing, and what troubled him was that the dog never got any rest. As a rule the animal was scratching the whole time, and why that should be so he did not know. He had shown the dog to several people and the dog had been given a multitude of agents in treatment (he was bubbling over with arsenic, for instance), but nothing seemed to have the slightest effect upon the condition.

Major TAYLOR said that he had had a look at the spaniel, in conjunction with the President's friend, the M.O.H., and on a cursory examination one would probably put it down to ordinary dog eczema associated with impetigo. The difficulty was, however, to ascribe a cause to those conditions in old dogs. This animal was 11 years old and was suffering from fibroid melanosis; it also had an angioma of the scrotum. His opinion was that the chronic skin diseases often were urinary in origin. Both of the dog's testicles were atrophied and there was a strong probability of disease of the kidney.

Quite recently he was called to see a dog with chronic eczema of the hind quarters, and on examining it he found that the right testicle was suffering from a thickened cord, while the left testicle was almost entirely atrophied. He removed both the large right testicle and the small atrophied testicle and dressed the skin with Odylen every third day; he also put the dog on thyroid extract. It was becoming quite a rejuvenated dog and the hair was growing quite profusely on the back, which had been bald for many years before.

Mr. E. J. HEATHER observed that it might be of some use if an examination of the fæces of the dog was made to see if there was any undigested material present in the alimentary tract pointing to any pancreatic deficiency. If that were so, a course of good pancreatic extract—and splenic extract, too, with advantage—would effect a big improvement.

The PRESIDENT stated that the spaniel had always had a great appetite and apart from the presence of the tumours, had been a very healthy dog. Of course, as they knew, the origin of tumours was a matter of obscurity, and if they could ascertain that they would solve the whole problem of the cause of cancer. It might indeed be that that skin disease had some connection with the urinary tract. He was very interested in Major Taylor's case and they might try some such treatment as he had suggested.

This concluded the business, and the members now joined the ladies in the College dining hall, where tea was provided by the courtesy and kindness of the Warden and Bursar.

At the conclusion of this repast Mr. COLEMAN proposed a hearty vote of thanks to the Warden and Bursar and to the Vice-Principal for the excellent entertainment with which they had provided the Division throughout the afternoon, and for the splendid repast which the company had first enjoyed. They had all greatly appreciated the opportunity of viewing those impressive buildings, and the students were certainly fortunate in having surroundings so helpful to their studies.

Their most hearty thanks were due to Major Duncan, their President, for giving them the opportunity of coming there. (Hear, hear). Moreover, they were much looking forward to the short tour they were about to take through the Cotswold country. Even to those of them who knew that country so well, its beauties seemed to come fresh every time they visited it; they could never become satiated. (Hear, hear.)

As they all knew, the veterinary profession had its own teaching schools, and what he had seen that afternoon had so impressed him that at the next meeting of Council, R.C.V.S., he was going to put forward the view that students should be resident in their Colleges. He was confident that that would be conducive to better results. The veterinary course was now extended to five years, and the extra year would be very advantageous, especially if the students were living in College.

Mr. P. S. BROWN, the College Warden and Bursar, acknowledging the heartily-recorded vote of thanks, said that it gave him very great pleasure to say how very glad the College Staff were to have the members of the Royal Counties Veterinary Medical Society with them that day, and if they had enjoyed their visit he and his colleagues were more than satisfied. They had expressed their delight in the College buildings and surroundings; they could imagine, therefore, how those who lived there must love them. (Hear, hear.) They appreciated very highly the expression of their appreciation which had been given by the President. (Applause.)

Mr. J. F. H. THOMAS, the Vice-Principal, in further ac-

knowledgment, said that their main purpose was to turn out young men who would be of real value to the great industry of agriculture and so to the country and to the Empire. He joined with Mr. Brown in saying how very much they enjoyed having them there; they felt that the College had been honoured by their visit.

The PRESIDENT expressed his indebtedness to Mr. Coleman for the kind reference he had made to his small part in the day's events. He felt, however, that thanks were more due to them than to him for having come so far to visit Cirencester, its famous College, and the "Cotteswold" country (to use the native spelling).

After tea some of the members and visitors took a short motor drive in the district in order to view some of the typical scenery of the Cotteswolds.

From the College the procession of motor cars passed through the town of Cirencester, traversing the spacious market place, where one cannot but notice the old Church, which is said to compare in size with the great churches of Yarmouth and Coventry, while bearing the stamp of the district in its architectural features.

Continuing eastward along the old Roman road, believed to be the Roman way known as Iknield Street, the village of Barnsley was soon reached. This village, doubtless quite unknown to the outer world, is typical of the Cotteswold village, the grey, brown stone built cottages, with large roofs of similar coloured stone slabs forming a colour background picked out and relieved by the green and red of climbing roses and other flowers adorning nearly every cottage. Next came Bibury, a gem of Cotteswold villages, of which it was said that it was "surely the most beautiful village in England." Descending the hill, there is a charming glimpse of the bridge over the Coln river, with the old Swan Hotel in the background, while the row of cottages known as Arlington Row is well beloved of landscape painters.

The remainder of the short tour led along the Coln valley. Here the scenery is pleasing to the eye and restful. We have no "land of brown heath and shaggy wood" or "Land of the mountain and the flood" but a gently undulating country with rippling streams, dotted with tiny villages, exemplified in this short tour by such as Winson, Coln Rogers, Coln St. Denis, and others—so quiet and peaceful as to make one almost forget the noise and toil of our great cities, and say, as someone has said, "Doubtless God might have made a better country, but doubtless also he never did."

H. BELL, *Hon. Secretary.*

Veterinary Inspection for Tuberculosis.

At a recent meeting, the Nantwich R.D.C. considered resolutions of Bebbington, Bromborough, Hoylake and West Kirby Councils, asking the Cheshire County Council to enforce regular inspection of milch cattle in their districts with the object of ascertaining whether they were tuberculous, instead of continuing the practice of ascertaining the presence or otherwise of such disease by milk examination. The resolution suggested the holding of a conference of local authorities on the question in October next at Chester.

The County Council wrote that they were opposed to periodical veterinary inspection of milch cattle, but approved the continuing of the taking of samples of milk for biological testing and had arranged for 100 tests during the coming year.

The County Council's attitude was approved.

Veterinarians and Animal Nutrition: A Refutation.

The attention of the Association having been directed to the editorial article in *The Fertiliser, Feeding Stuffs and Farm Supplies Journal* of August 20th, 1930, which is reproduced below, the letter which follows was addressed to the Editor of that journal, appearing in the issue of September 3rd.

VETERINARY CONGRESS.

"The Eleventh International Veterinary Congress was opened by the Earl of Harewood on August 4th in Central Buildings, Westminster.

"We believe that this meeting attracted a record number of members, but, although the Congress was held in London, the casual visitor must have remarked that veterinary surgeons from home were not present in conspicuous numbers. The ordinary visitor to the Congress making a tour of the trade exhibition was first impressed, or rather depressed, by the atmosphere of the basement in which this section was housed, and we should imagine that a far better trade exhibition would be staged if the exhibits were more closely associated with the main business of the Congress—the various papers and discussions on them. Interested as we are in the use of feeding stuffs and fertilisers, we were rather surprised that very little attention was given in the trade exhibition to nutrition—either direct or indirect.

"The veterinary profession seems to be passing through a phase in which vaccines and sera play a most important part and, much as we may welcome these aids in the prevention and cure of animal diseases, we feel that the profession does not pay sufficient attention to the influence of proper feeding in the health of the animal.

"The average veterinary surgeon is not an expert in the feeding of animals and there seems to be a gap between the veterinary surgeon and the expert on feeding. This is a pity, because the farmer is inclined to look to his veterinary surgeon for help and advice on feeding matters, particularly in view of the recognised bearing of feeding on animal health.

"Further, though it may seem a long stretch from veterinary practice to the use of fertilisers there is no doubt that the use or neglect of use of fertilisers and manures is an important factor in the nutrition and welfare of animals. No doubt the time will come when an international live-stock congress will do the same for all classes of animals as the recent World's Poultry Congress has done for poultry, by bringing together people of all nationalities interested practically in stock rearing and in all branches, scientific and commercial, associated with the live stock industry."

* * * * *

The Editor,
"Fertiliser, Feeding Stuffs and Farm Supplies Journal,"
38, Shoe Lane, E.C.4.

August 29th, 1930.

Dear Sir,—My attention has been directed to the Editorial article, appearing in your issue of August 20th, on the subject of the Eleventh International Veterinary Congress, wherein occasion is taken to allege insufficiency of knowledge of, and attention to, the nutrition of animals on the part of the members of the veterinary profession, who are made the subject of a detrimental comparison with the "expert on feeding" (Agricultural Adviser?) in this connection.

Such ill-founded statements as appear in your article are liable to convey to the readers of your journal an entirely false impression of the training, ability and interest of veterinary surgeons in the important subject of the nutrition of animals, which, in fact, forms a prominent feature of the work of the veterinarian of the present day. His College curriculum gives him a sound training in botany, chemistry, physiology and dietetics, such as is

not possessed by many either officially or self-styled "experts on feeding," while the subject finds a conspicuous place in his veterinary literature and post-graduate instruction.

The general veterinary practitioner, therefore, is pre-eminently fitted to give advice on the correct feeding of animals, while the profession claims a considerable number of members who have gained eminence for their knowledge and experimental work in this branch of veterinary science. In your references to the International Veterinary Congress you apparently overlooked the very pertinent fact that two of the papers were solely concerned with this subject; indeed, these contributions and the discussions upon them constituted a striking refutation of your chief contention.

It is hoped that you will give publicity to this letter in your next issue and thereby enable your readers to appreciate the important facts that not only does the training of the veterinary surgeon fit him for giving advice on all matters relating to the nutrition of farm stock, but that the veterinary profession has never been behind-hand in recognising the importance of the relationship between the proper feeding of animals and animal health, both from the scientific and economic points of view.

Yours faithfully,

F. KNIGHT,
General Secretary.

From The Veterinarian,

AUGUST, 1830.

Essays on Horse Medicine;

COMPREHENDING THE THEORY AND PRACTICE BOTH OF THE FRENCH AND ENGLISH VETERINARY SCHOOLS.

ARTICLE III.

Of Disease in the Blood—Humours—Transfusion.

In former days, all disorders of spontaneous or obscure origin were supposed to proceed from some altered condition of the fluids or "humours" of the body, of which the blood (the most generally diffused and copious of them) was accounted to be the principal or *matrix*; either the humours were said to superabound, to be overheated, to be impure or vitious, or even to be putrid; which doctrine constitutes what modern medical philosophers have denominated the "humoral pathology." The lights, however, in later times cast upon medical science have dispelled such mysterious and ill-grounded notions from the mind of the modern physiologist; as he has become enlightened in his progress, he has become convinced that such notions are erroneous; that, as the solids are, admissibly and demonstrably, organised bodies, whereas the fluids or humours are but the products of organisation, the condition of the latter must necessarily depend upon the state of the former; so that, to assert that an altered fluid itself constitutes the essence of disease, is, evidently, mistaking the *effect* for the cause. With equal reason might one declare in a cankered tree that yielded bad fruit, that the fault was not in the tree, but in the fruit; it is manifest, however, that such is not the case; that the evil is owing to some defective organisation or function in the tree, or else to the nature of the soil in which it is planted.

The adoption of such notions among the physicians of former days, and the seeming plausibility of them, speedily led to their propagation among the community at large; and from the minds of non-medical people in general, up to the present hour, may it be said that they are far from being eradicated. How often do we hear in the course of our practice of people talking of the blood being too "rich," or too "poor," too "thick," or too "thin," or too "hot," etc.; and no class of persons seemed to have imbibed these false tenets with more avidity, or to have clung to them with more notorious obstinacy, than our grooms and farriers, and riding-masters and horsemen in general; for, are we not continually, up to the present hour, hearing these people complain of horses having "humours in their eyes," humours in their skin," and being "full of humours"? Were it at all necessary to illustrate what I have just affirmed, I might cite the most ridiculous and absurd passages from works on farriery and horsemanship, even of modern date; but it is not; nor would it be worth my while to dwell upon the subject at all, were it not to show that the doctrine is not merely erroneous, but a dangerous one to entertain, in consequence of its dictating a mode of treatment both indirectly injurious from want of efficacy, and positively pernicious from co-operation with the morbific agents themselves.

By the humoral pathology, we are taught to believe that there is some peccant or offending matter floating about in the fluids or humours; and that, nature requiring the expulsion of this imaginary acrimonious matter, instigates a diseased action in the constitution for that purpose; which it may be right to promote, but is on all occasions wrong, on the part of the practitioner, either to check or to suppress. On which accounts it was that this doctrine, when introduced into practice, turned out to be pregnant with all sorts of dangers.

Unsupported by the progress of science, and both inefficacious and dangerous in practice, the humoral pathology gave place to a set of more sound and wholesome principles; as commonly happens, however, on such occasions, the introduction of entirely new doctrine has not been brought about altogether exempt from error, or, at least, from that which has given rise to fresh dispute.

For example, the blood, the principal of the humours, although it occasionally exhibits morbid appearances, is yet, it is said, never in itself diseased; in other words, does not imbibe any morbific ingredient. In support of which doctrine, the two principal arguments are, first, that if it were in itself in a state of disease, as it flows to every part of the body, the morbid matter it contains ought to create *general* and not local irritation; and, secondly, that if it were so in contagious diseases, we ought, by means of inoculation with it, to produce effects such as arise from the actual introduction of contagious matter. In reply to the first of these arguments, it may be asked, if there exists any disease that affects alike all parts; and why, on the contrary, so many seem to have a predilection for particular organs or structures? In man, for instance, small-pox and measles manifest their influence upon the skin in particular; scrofula is a disease of the absorbent system; the venereal disease attacks the organs of generation, the throat, the skin, and the bones. In the horse, we have farcy, which is a disease of the *superficial* absorbents, in exclusion to vessels of the same class and kind that are *deep-seated*; and glanders generally confines its ravages to the mucous membranes of the nose and sinuses of the head. And yet, all these are (with the exception of scrofula) contagious diseases, in most of which, if not in all, the circulating mass of blood is contaminated.

The second of these positions is still less tenable than the first. No one ever imagined that any morbific matter the blood might contain, existed therein in so concentrated a form as to take effect through the medium of a drop or two of that fluid; any more than that glandered or venereal virus, diluted with fifty or a hundred times its weight of healthy matter, would impart the disease through inoculation with a fiftieth or a hundredth part of such a mixture. Do we not, medicinally, take (not only without any baneful influence, but with great and decided benefit) small portions of substances of so poisonous a nature, that the old practitioners in medicine were, on that account, wholly deterred from the use of them!

But, without any further reasoning, we may adduce an experiment made some years ago, at the Veterinary College; which, in our mind at least, sets the subject

"The Tattersall's of the North."

LIVERPOOL FIRM TO GIVE UP BUSINESS.

"One of Liverpool's oldest established and best-known trading concerns—Lucas's Horse and Carriage Repository Company, Ltd.—which many years ago earned for itself the title of "The Tattersall's of the North," is going out of business," says *The Liverpool Post*, of September 3rd.

"This passing of Lucas's Repository is a commentary on the silent revolution which has been going on in our social and industrial life during the past quarter of a century. It is all due to the growth of mechanical traction, which has converted us from a horse-driven to a motor-propelled community.

"The history of Lucas's goes back to well over a hundred years ago, when two brothers, Matthew and Robert Lucas, started business as veterinary surgeons in a building in Great Charlotte Street, now occupied by the Wholesale Fish Market. To their veterinary work they had added within a few years the business of horse-dealing, and their auction sales soon became a regular and increasingly popular feature of Liverpool business life. . . .

"In those early days, Lucas's Repository was known throughout the horse-breeding centres of Europe, the United States, and South America. There was no other horse saleroom in this part of the country nearer than Leicester, and to Lucas's Repository were consigned many ship loads of Russian and Norwegian cobs and ponies, and young mettlesome steeds from New York, New Jersey, and the Argentine.

"At that time, too, Lucas's did the bulk of the veterinary work of the town, and the repository was the recognised stabling centre for gentry coming into Liverpool from the country. Whenever the then Lord Derby or Lord Sefton rode into Liverpool they always "put up" their horses and carriages at Lucas's. Then Hotham Street was musical with the clatter of ringing hoofs and jingling harness. How times have changed!

"Twice a week for year after year lovers of horseflesh were wont to gather at Lucas's for the business of buying and selling. Wednesdays were reserved for the auctioning of heavy horses—for which Liverpool was, and still is, noted—and on Saturdays tradesmen's turn-outs, vehicles included, came under the hammer. Every alternative Thursday high class harness horses, cobs, and ponies were on offer. Many famous English hunters have changed hands at Lucas's, and most of the heavy horses acquired by the Corporation and the big brewery companies were auctioned there. But all this happened years ago. Nowadays such horses as are in use are bought at country fairs or direct from the farmer breeders, and for several years past Lucas's auctions have been reduced to one per week.

"It was a little bit out of their ordinary business, but for a long time Lucas's made an annual feature of a sale of greyhounds. The sale was always held on the day of the draw of the Waterloo Cup, when all the leading "doggy" men of the country were in Liverpool. Valuable studs of greyhounds were auctioned on these occasions. It may be recalled also that every autumn Lucas's have auctioned off the stud of horses used by the Douglas Corporation during the summer season on the promenade tramway system."

---

beyond the pale of disputation. Premising that glanders is a contagious disease, and one that is at all times communicable by inoculation, the blood of a horse affected with that malady was transfused into the veins of an ass in good health, previously prepared for the influx by a copious bloodletting. In the usual interval of time, the ass exhibited every symptom characteristic of glanders; and shortly after died under the deleterious consequences of it.

(To be continued.)

Notes and News.

The Editor will be glad to receive items of professional interest for inclusion in these columns.

Diary of Events.

Sept. 22nd.—N.V.M.A. Editorial Committee, 2 Verulam Buildings, Gray's Inn, W.C.1, at 4.30 p.m.

Dr. Griffith Evans.

The splendid tribute paid to the work of Dr. Griffith Evans, the veterinarian discoverer of the first pathogenic trypanosoma, paid by Dr. Du Toit in his address as President of the Agricultural Section of the British Association (to be reproduced by us in full next week), induced the Bangor Correspondent of the *Daily Express* to interview him at his home. In the resultant article, published on September 10th, it is stated:—

"Dr. Griffith Evans, the father of the world's veterinary surgeons, whose work in discovering a deadly cattle disease germ in India fifty years ago has received homage at the British Association meeting at Bristol this week, is bedridden.

"For nearly two years this veteran scientist, who is in his ninety-sixth year, has lain in a room in his house on a hill overlooking Menai Straits. His mind is very active, and he has taken up the study of philosophy.

"When I saw Dr. Evans to-day he was so embarrassed that British scientists had once more paid tribute to his work that he became silent.

"'Every fifteen years or so,' he said, 'kind references are made to my work.'

"Two years ago the head of the Burmese Government Veterinary Station called on Dr. Evans and described him as 'the father of his profession.' Last year he was visited by American scientists.

"Dr. Evans retired from the Army in 1880, and for twenty years was lecturer in veterinary science in North Wales University College, Bangor. Nearly fifteen years have passed since he was honoured by the University of Liverpool with the Mary Kingsley Medal for his work in combating tropical diseases.

"During the American Civil War he travelled for months among the hospitals of the Northern Army, and recorded in his diary long talks with President Lincoln, Generals Grant and Sherman, and other leaders; but a few years ago he destroyed his diary."

. . . . .

R.C.V.S. Obituary.

KYLE, JAMES BROWN, Main Street, Limavady, Co. Londonderry. Graduated Glasgow, July 19th, 1927, died August 31st, 1930.

In reference to the above, the *Derry Standard* of September 1st says:—

"Intense sorrow was occasioned yesterday by the death of Mr. James Brown Kyle, M.R.C.V.S., Limavady, after an illness of but a few days' duration. Few realised that his illness was of a serious character, and the news of his early passing came in the nature of a painful shock to a community in which he was extremely popular and greatly esteemed.

Aged but 30 years, deceased was the elder son of the late Mr. J. C. Kyle, M.R.C.V.S., and was educated at Roebank School, Limavady, and the Academical Institution, Coleraine. During the Great War he enlisted in his 16th year and served as a dispatch rider in the Royal Marine Artillery, being wounded twice in action. After demobilisation he spent some time in British East Africa as manager of a flax development company. Subsequently studying for the veterinary profession, he graduated with distinction from the Glasgow Veterinary College in 1927,

and after assisting his father for a couple of years succeeded him on his death a year ago. He conducted his late father's extensive practice with marked success, and in addition, held the offices of Veterinary Inspector under the Derry County Council for the Limavady district, Inspector of Dairies for both the Limavady Rural and Urban Councils. He also accomplished a considerable amount of professional work under the Derry County Council's Tuberculosis Order.

Deceased leaves a widow and son, and with them and the other relatives there is sincere and widespread sympathy in their great sorrow."

. . . .

DEATHS OF MESSRS. E. G. AND JOHN DUNSTAN.

As we go to press we are informed, through the medium of the following press cutting from the *Western Morning News*, of the lamentable news of the passing, within a short time of each other, of Mr. E. G. Dunstan, of Okehampton, and his brother, John Dunstan, of Liskeard, two exceedingly well-known West-country veterinary surgeons, who were prominent members of the Western Counties Division of the N.V.M.A. The paper states (September 13th):—

"Sincere regret was expressed at Okehampton yesterday morning when it became known that Mr. E. G. Dunstan, one of the best-known veterinary surgeons in the West of England, had died. Mr. Dunstan was attending to his professional duties as late as Tuesday last. He was taken ill, and the cause of death is attributed to heart trouble.

"Well known in his profession, he was veterinary surgeon to the Eggesford Hounds, Okehampton Agricultural Society, and the local Fat Stock Show, and was always ready to do anything for their advancement. He took no part in public life. He leaves a widow and two children.

"It is a tragic fact that he was to have attended the funeral of his brother, Mr. John Dunstan, at Liskeard Parish Church yesterday, at which the Rev. W. Dudley Dixon (brother-in-law), vicar of Netherfield, Notts, officiated.

"The Western Counties Division of the National Veterinary Medical Association was represented by Major W. N. Wright (Torquay), Major W. Ascot (Bideford), Messrs. S. J. Motton (Penzance), H. W. Townson (St. Austell), J. Willis Thwaite (Liskeard), C. Crowhurst (Bodmin), F. T. Harvey (St. Columb), C. C. Parsons (Launceston), and W. L. Richardson (Wadebridge)."

Army Veterinary Service.

LONDON GAZETTE—WAR OFFICE—REGULAR ARMY.

September 9th.—Lt.-Col. E. P. Argyle, D.S.O., having attained the age limit for compulsory retirement retires on ret. pay (Sept. 7th).

Maj. H. J. Holness, D.S.O., to be Lt.-Col. (Sept. 7th.)

By September 21st, the sheep of Caernarvonshire, Denbighshire, Flintshire, Merionethshire, Montgomeryshire, that part of Cardiganshire north of the Aberystwyth to Eisteddfa Gurig Road, and two parishes in Shropshire must have passed through the dipping baths for the second time this season. The whole of this area, containing nearly four million-odd sheep, is a "double-dipping area" under the order of the Ministry of Agriculture.

The fact that there has been no extension of foot-and-mouth disease in the Leeds area since the first outbreaks took place during the week-end suggests to the Ministry of Agriculture officials in Leeds that the disease has been effectually checked.

A close watch, however, is being kept in any direction where "contacts" are suspected, and the restriction of movement order remains in force throughout the whole of the scheduled area. . . .

A further outbreak of foot-and-mouth disease was notified at Pirbright, Surrey, on September 15th. The Ministry has issued the usual restriction order.

Tick Eradication Obstructors Sentenced.

"For conspiring and interfering violently with employees of the U.S. Bureau of Animal Industry engaged in tick eradication, Mann Carter and his son, Will Carter, of Echols County, Georgia, must serve seven years in jail and pay fines in accordance with the sentence imposed more than a year ago by the United States Court of the Southern District of Georgia. The United States Supreme Court, to which the case had been appealed, has refused writs of certiorari. This puts an end to the last of the several widely-known Echols County dipping cases.

"Mann Carter was sentenced to seven years imprisonment and was fined $11,000. His son, Will Carter, was sentenced to seven years imprisonment and was fined $1,000. These cases grew out of local opposition to the work of eradicating cattle ticks in Echols County, Georgia, which resulted in the destruction of dipping-vats, in the burning of spraying-pens, and in interference with Bureau employees. These culminated February, 1923, in the killing of one Bureau agent. Another was wounded seriously.

Notwithstanding the organised opposition to the dipping of cattle, tick eradication was completed in Echols and surrounding counties several years ago and, as a result, general satisfaction has prevailed among cattle-owners and others, the Department of Agriculture reports."—*Journal A.V.M.A.*

The recent reference in the Press to the inspection of boneless meat has induced the High Commissioner for Australia (Sir Granville Ryrie) to explain the course of procedure in the preparation of beef shipped from the Commonwealth. The particulars given by Sir Granville will remove any possible doubt concerning the system of inspection adopted in Australia. All inspections are made when the organs and viscera are present and *in situ*, precisely as is required by the most exacting authority, and it is clear that so far as Australia is concerned no anxiety whatever need be felt on the points mentioned.

The Medical Research Council has adopted a particular preparation of irradiated ergosterol as a standard of reference for Vitamin D; and, as a unit in which to express the potency of different antirachitic substances, it has decided to use that amount of antirachitic activity represented by 0·0001 mg. of the original ergosterol of the standard preparation.

Ten thousand tons of whale meat are reported to have been canned by the "Thorshammer," a noted Norwegian whale factory ship, which has just completed a six-months' cruise in the Antarctic, during which time 1,065 whales were caught. It is suggested that there is a bright future before the whale canning industry, but we have always understood that attempts made to introduce canned whale into restaurants in Europe and America have hitherto proved unsuccessful. Along the coasts of the various continents, where whale flesh is eaten, it is described as resembling very closely ordinary rump steak.—*Jour. Inst. Hyg.*

Correspondence.

Letters to the Editor should reach the Office not later than by the first post on Tuesday morning for insertion in following Saturday's issue.

All correspondence must bear the name and address of the contributor for publication.

The Editor does not hold himself responsible for the opinions of his correspondents.

Sex Determination.

TO THE EDITOR OF THE VETERINARY RECORD.

Sir,—I was deeply interested in the observations of Mr. J. H. Ripley on the above subject as recorded in your issue of September 6th.

I am acquainted with several stockbreeders who strongly affirm that, in bovines, service at the first, or third, or fifth, etc., œstrum following parturition results (if conception takes place) in progeny of the opposite sex to that of

the preceding pregnancy; and that service at the second, or fourth, or sixth, etc. œstrum results in progeny of the same sex as the preceding offspring. In one particular case, the breeder made a forecast (based on this system of "regulated" service) of the sex of all calves expected on his farm during the year, and in only one case out of a series of twenty-five calves was his forecast incorrect. In the case of the one exception, it was found that, unknown to the breeder, the cow had failed to conceive at the first service, and was successfully mated (under the direction of the cowman) at the next œstrum, and her calf was of the same sex as her previous calf.

In the case of wild bovines, roaming in herds at large, it is probable that service always takes place at the first œstrum, so that according to this theory, and providing that the animals concerned are sexually healthy, the sex of each offspring should alternate at each pregnancy. Perhaps some biologist can enlighten us as to whether this is what actually takes place?

This theory of sex-determination seems worthy of either confirmation or "explosion" by our animal-geneticists.

In connection with the article on "Milk Fever" by Mr. R. S. Smythe of Camborne, also published in the issue of September 6th, I can confirm his observations that in early cases of milk fever, where the cow is on her feet, and at the "paddling" stage, inflation of the udder does very frequently cause a temporary aggravation of symptoms, and very often the cow "goes down" suddenly and heavily during the process of mammary-inflation and assumes a comatose condition.

Yours faithfully,

HAROLD BURROW, M.R.C.V.S., D.V.S.M.

23, Woodside Lairage,
Birkenhead.
September 8th, 1930.

Calcium Treatment of Milk Fever.

TO THE EDITOR OF THE VETERINARY RECORD.

Sir,—The striking article by Messrs. Bovett in your issue of June 14th last on the value of calcium gluconate (Sandoz) in the treatment of milk fever induced me to give the treatment a trial.

The first case that presented itself was a Guernsey cow which had milk fever 12 months ago and recovered with the usual inflation. She calved again on June 18th, went down on the 19th, was inflated and got up eight hours after. I saw her again at 11 a.m. the next day when, not being quite satisfied, although she was up, I reinflated the udder. I was sent for at midnight and found her quite comatose and breathing stertorously. I then injected her with calcium gluconate as a forlorn hope, for, to be honest, I had not much faith in anything being likely to save her. On visiting her the next morning I was told a miracle had happened. She became conscious and got up an hour after the injection, and in three hours was chewing her cud. She made a good recovery, and naturally I was encouraged to follow up this line of treatment as it seemed to me to have succeeded where inflation had failed. Since then I have treated 27 cases with calcium gluconate only, with the following results:—12 (counting the foregoing) were up within two hours, ten within five hours, four within 12 hours and two within 24 hours; 25 were injected once, two were reinjected at the end of 12 hours and one at 48 hours; 26 made good recoveries and two died. These two were the ones that were reinjected at the end of 24 hours and both had been drenched with magnesium sulphate prior to my arrival.

I followed the directions outlined by Messrs. Bovett, *i.e.*, two ounces of calcium gluconate (Sandoz) were dissolved by boiling in two pints of water, carefully filtered, cooled to blood heat and injected by gravitation. The site I prefer is that usually selected for intradermal testing, where I have had no difficulty in injecting the whole of the two pints, and so far as I know there has been no sloughing; at any rate, I have not had any complaints from the owners, the majority of whom I have seen many times since the treatment.

Yours faithfully,

Bideford. WM. ASCOTT.

TO THE EDITOR OF THE VETERINARY RECORD.

Sir,—May I be allowed space to reply to the article by R. H. Smythe of your last issue, and also to comment on the recent adverse criticisms of calcium treatment in milk fever?

Mr. Smythe's statement that the symptoms of milk fever and allied diseases can be *temporarily* alleviated by the use of calcium salts, and that *repeated* injections are necessary, otherwise only partial recovery occurs and relapse ensues, is quite misleading to those practitioners who have yet to try the newer method in the treatment of these diseases, and belittles the work of the pioneers of calcium therapy. (The phrases I have quoted do not run consecutively, but I gather from his paper that they indicate Mr. Smythe's opinion of the treatment).

After the experimental work of Dryerre and Greig demonstrating the highly important relationship between milk fever and calcium metabolism, came the very satisfactory clinical application of the results by several practitioners—results not limited to one or two isolated successful cases, but upwards of 100 cases from many parts of the country. Where failures did occur they were in some cases retrieved by second injections, and there were some which, through lack of appreciation of the requisite quantities and technique, either only partially succeeded or completely failed. There are bound to be some failures whilst practitioners half-heartedly tackle their cases with too small quantities of calcium, instruments which are not sterile (for subcutaneous or intravenous therapy), or where material other than filtered solutions is utilised.

I think one is safe in saying that, using sterile ampoules in adequate quantities, preferably both intravenously and subcutaneously, by means of apparatus easily sterilisable, there have been and will be very, very few failures. Only one injection should be necessary, just as in udder inflation, but occasionally a second treatment may be necessary. As the therapy is better understood the method may be considerably simplified because, as it is hoped to point out in a short article on calcium metabolism, the simple injection of calcium salts is only a part of the ideal therapy.

Mr. Smythe finds it difficult to understand why milk fever does not occur more often when the milk yield is at its highest, instead of within the first few days of calving. It should be understood that the mineral, and more especially the calcium, content of *colostrum* is markedly higher than that of ordinary milk, and therefore allows the greater elimination of the mineral from the body.

The theory which Mr. Smythe puts forward has many attractive features, but unfortunately the only experimental evidence to support it is that of Gaines. That the udder may manufacture an internal secretion is quite believable, but specific association with an antagonism to the parathyroids and suprarenals because of their relationship to mammary secretion is more difficult to believe. The pituitary body would appear to have more association with commencing lactation than either of the above-mentioned glands. There have been numerous experiments involving the possible internal secretion of the mammary gland, but no workers appear to have found evidence to support this theory of inhibition of mammary secretion; that is as far as one can read in the available text-books on endocrinology.

It is interesting, however, to note that many writers state that calcium excretion is much greater than normal during œstrum, a fact which Mr. Smythe has had opportunity of confirming clinically, even to the extent of observing and of treating such pseudo-milk fever signs. It may interest Mr. Smythe to know that a few days ago I took the opportunity of treating a milk fever relapse (primarily treated by mammary inflation) with calcium gluconate. The cow recovered without abscess formation or other untoward effect but immediately the calcium had been injected there was a definite exacerbation of the signs. This could hardly have been due to release of "mammary hormone," but was probably due to the disturbances created by the sudden influx of available calcium—a metabolic reaction?

Finally, I fail to see how Mr. Smythe's Case Note 1 bears out his statement that "the factor which precipitates

an attack of milk fever is an *abnormal* stimulation of the udder cells " for both cows were barren and had been " dry " for six months.

Yours faithfully,

W. P. Blount.

Leas End,
Sandgate Hill,
Folkestone.
September 6th, 1930.

. . . . .

To the Editor of The Veterinary Record.

Sir,—*Re* recent letters to the *Record* on " sloughing " after the subcutaneous injection of calcium gluconate, I would like to place on record that this has not been my experience. The administration of the Sandoz preparation of the above has been carried on extensively in my practice; and on many occasions as much as four ounces of the " salt " has been injected after being dissolved in a quart of boiling water. Slight swelling and evidence of pain on pressure at the site of the injection has indeed been noticed on many occasions, but always of negligible proportions; this difference in results obtained I attribute to the fact that we never inject more than 50 c.c. of the solution at any one point.

With apologies for writing on this subject again, I should also like to add that since the work carried out in collaboration with Professor Greig, I have come to the conclusion that the best results in cases of milk fever are obtained by differentiating the treatment according to the symptoms. When there is no decided diminution of the milk secretion, I consider that the inflation of the udder is the best form of treatment; when the reverse is the case (the usual type) then the subcutaneous injection of calcium gluconate gives more satisfactory results, in my judgment.

I am, yours faithfully,

Oscar Stinson.

Appleby,
Westmorland.
September 7th, 1930.

To the Editor of The Veterinary Record.

Sir,—The recent notes and correspondence on milk-fever prompt me to ask if members find that milk-fever follows an easy time at calving. In this practice, at any rate, the very great majority of attacks occur after a normal unaided calving; in fact, the almost constant answer to a question on this point is " She calved herself."

Is this the case in other practices or just a coincidence; and, if constant, is there an explanation?

J. G. Hoban.

Mill Street,
Whitchurch.
September 9th, 1930.

. . . . .

Insurance of Veterinary Surgeons' Motor Cars.

To the Editor of the Veterinary Record.

Sir,—We beg to confirm that we have made special arrangements with some of the leading Non-Tariff Insurance Companies, whereby they have agreed to issue Policies to Members of your Association at ordinary Private Car Rates *but endorsed covering the use of such vehicles whilst being used for Professional Purposes by such Member and/or Partner, and/or Locum Tenens, and/or Assistant, without any extra charge*, subject, of course, to a satisfactory completed Proposal Form.

Yours faithfully,

H. R. Bower (Insurance), Ltd.,
H. R. Bower, *Director*.

19, Gracechurch Street,
London, E.C.3.
September 2nd, 1930.

[The attention of our readers is directed to the announcement, relative to the above matter, appearing on advertisement page v of this issue.—Ed.]

Diseases of Animals Acts, 1894 to 1927.
SUMMARY OF RETURNS.

Period.	Anthrax.		Foot-and-Mouth Disease.		Glanders (including Farcy).§†		Parasitic Mange.§		Sheep Scab.	Swine Fever.	
	Outbreaks confirmed.	Animals attacked.	Outbreaks confirmed.	Animals slaughtered as diseased or exposed to infection.	Outbreaks confirmed.	Animals attacked.	Outbreaks reported by the Local Authorities.	Animals attacked.	Outbreaks confirmed.	Outbreaks confirmed.	Swine slaughtered.
	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.
Period 16 to 31 Aug., 1930	7	8	—	—	—	—	2	2	11	67	45
Corresponding period in—											
1929 ...	15	15	—	—	—	—	6	6	19	116	81
1928 ...	15	16	—	—	—	—	5	5	22	34	17
1927 ...	5	5	—	—	—	—	12	14	30	42	18
Total 1 Jan. to 31 Aug., 1930	256	280	—	†—‡	—	—	168	252	286	1,703	706
Corresponding period in—											
1929 ...	306	384	23	1,895	—	—	162	327	372	1,532	919
1928 ...	377	435	107	8,929	—	—	227	438	337	1,104	566
1927 ...	286	344	27	2,434	—	—	271	455	420	1,190	570

Note.—The figures for the current year are approximate only.

† Including outbreaks in recently imported animals.

§ Excluding outbreaks in Army Horses.